



Extron® Electronics

INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual



DXP Series Switchers

Serial Digital Video Matrix Switchers

Precautions

Safety Instructions • English

 This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

 This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

 Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

 Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les Instructions • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présents dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

 Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

 Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español

 Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

 Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

安全须知 • 中文

 这个符号提示用户该设备用户手册中有重要的操作和维护说明。

 这个符号警告用户该设备机壳内有暴露的危险电压, 有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备, 以避免危险。

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentation • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à des haute tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluss, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegen gestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitz und Öffnungen • Wenn das Gerät Schlitz oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Lithium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puenteárla ni eliminárla.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cable de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Descharar las baterías usadas siguiendo las instrucciones del fabricante.

警告

电源 • 该设备只能使用产品上标明的电源。设备必须使用有地线的供电系统供电。第三条线(地线)是安全设施, 不能不用或跳过。

拔掉电源 • 为安全地从设备拔掉电源, 请拔掉所有设备后或桌面电源的电源线, 或任何接到市电系统的电源线。

电源线保护 • 妥善布线, 避免被踩踏, 或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔, 它们是用来防止机内敏感元件过热。不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

FCC Class A Notice

NOTE This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

Quick Start — Digital XPoint Matrix Switchers

Installation

Step 1

Turn off power to the input and output devices, and remove the power cords from them.

Step 2

Mount the switcher in a rack or under a table.

Step 3

Connect:

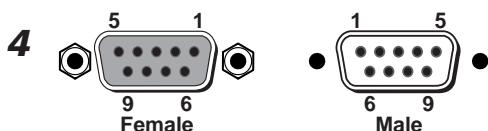
- a** Up to 4 or 8 SDI inputs to the Input In (top) connectors.
- b** Up to 4 or 8 SDI displays or other devices to the Input loop-through (bottom) connectors.
- c** Up to 8 or 16 SDI display or other devices to the Output connectors.

NOTE *Each output number consists of two identical SDI outputs.*



Step 4

If desired, connect a control system or computer to the RS-232/RS-422 port.



Pin	RS-232	Function	RS-422	Function
1	—	Not used	TX-	Transmit data (-)
2	TX	Transmit data	TX+	Transmit data (+)
3	RX	Receive data	RX+	Receive data (+)
4	—	Not used	RX-	Receive data (-)
5	Gnd	Signal ground	Gnd	Signal ground
6	—	Not used	—	Not used
7	—	Not used	—	Not used
8	—	Not used	—	Not used
9	—	Not used	—	Not used

Step 5

If desired, attach an external sync timing device to the external sync connectors.

Step 6

Plug the switcher, input devices, and output devices into a grounded AC source, and turn on the input and output devices.

Definitions

The following terms are used throughout this manual:

Tie — An input-to-output connection.

Set of ties — An input tied to two or more outputs. (An output can never be tied to multiple inputs.)

Configuration — One or more ties or sets of ties.

Current configuration — The currently active configuration (also called **configuration 0**).

Preset — A configuration that has been stored. One preset can be assigned to each input and output button. Additional presets are available under RS-232/422 control. When a preset is retrieved, it becomes the current configuration.

Front Panel Controls

Input and output buttons select and identify inputs and outputs. The buttons also select presets.

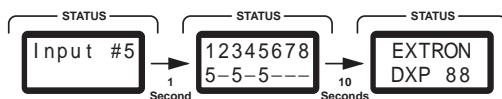
Enter button saves changes when you change the configuration.

Preset button saves a configuration as a preset or recalls a previously-defined preset.

Input and output buttons can hold text or icon inserts that can be created easily with Extron's label software.

LCD Displays

To view the current configuration, press and release the button for the desired input. The LCD displays the input number for approximately 1 second and then the current configuration for approximately 10 seconds. The LCD displays each output number on the top line and the tied inputs on the bottom line. To check the status of another source, press and release another Input button.



Quick Start — Digital XPoint Matrix Switchers, cont'd

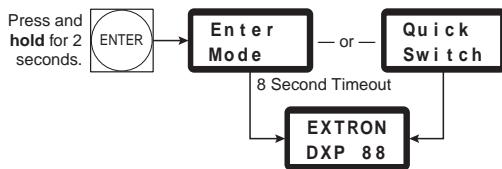
Quick Start button key



Toggle switch modes

NOTE The switch mode is for ties only and has no effect on saving and recalling presets.

Toggle between the two switch modes, *enter* and *quick switch*, by pressing and **holding** the Enter button for approximately 2 seconds.

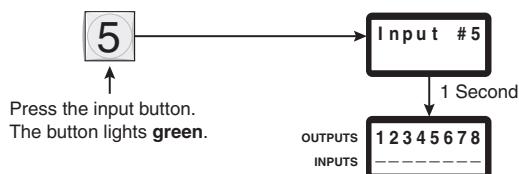


In enter switch mode, changes do not take effect until you press Enter. In quick switch mode, changes take place as you select them, without pressing Enter.

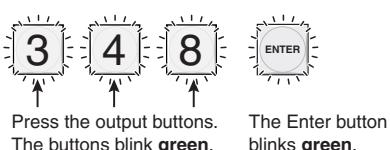
To check the current switch mode, press and release an output button. In enter switch mode, output buttons light green when selected. In quick switch mode, the output buttons light red.

Create a tie in enter switch mode

1. Press and release the desired input button.



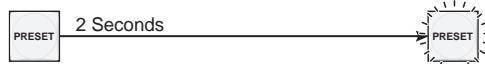
2. Press and release the desired output button(s).



3. Press and release the Enter button.

Save a preset

1. Press and **hold** the Preset button until the button begins to **blink**.



Press and hold the Preset button until it blinks.

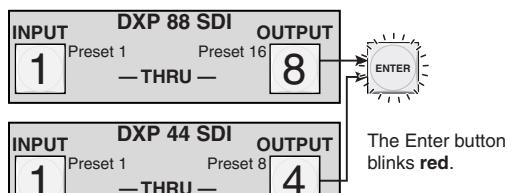
Outputs displayed until the DXP enters save preset mode.



2. Press and release the input or output button associated with the desired preset number.

NOTE **DXP 88 SDI:** The buttons select preset 1 through 16, in order.

DXP 44 SDI: The buttons select preset 1 through 8, in order.

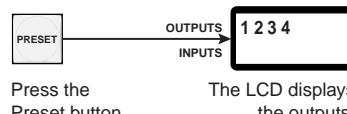


Press and release an input or output button.
The button lights red.

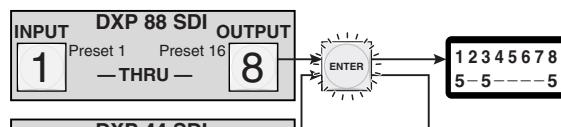
3. Press and release the Enter button.

Viewing or recalling a preset

1. (DXP 44 SDI shown.) Press and release the Preset button.



2. Press and release the input or output button associated with the desired preset number.



Press and release an input or output button.
The button lights red.

The LCD shows the tie's configuration.

3. To recall the preset, press and release the Enter button.

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Digital XPoint Matrix Switchers

1

Chapter One

Introduction

About the Digital XPoint Series Matrix Switchers

Features

Introduction

About the Digital XPoint Series Matrix Switchers

The Extron Digital XPoint Series Matrix Switchers are serial digital interface (SDI) matrix switchers that distribute any SDI input to any combination of SDI outputs. The matrix switchers can route multiple input/output configurations simultaneously. Two matrix sizes are available:

- DXP 44 SDI (four inputs by four outputs)
- DXP 88 SDI (eight inputs by eight outputs)

The switchers conform to the SMPTE 259M specifications and route signals in all composite (143 Mb/s and 177 Mb/s), component 4:2:2 (270 Mb/s), and widescreen 16:9 (360 Mb/s) SDI video standards. Each input signal is equalized: a 270 Mb/s input signal is equalized for distances of 1000 feet (300 meters) on high quality cable such as Extron RG6 BNC Series Super High Resolution coaxial cable. Each input signal is buffered and looped through to allow it to be sent to other equipment. Each output has dual buffered and equalized BNC outputs (two identical output signals per output) (figure 1-1).

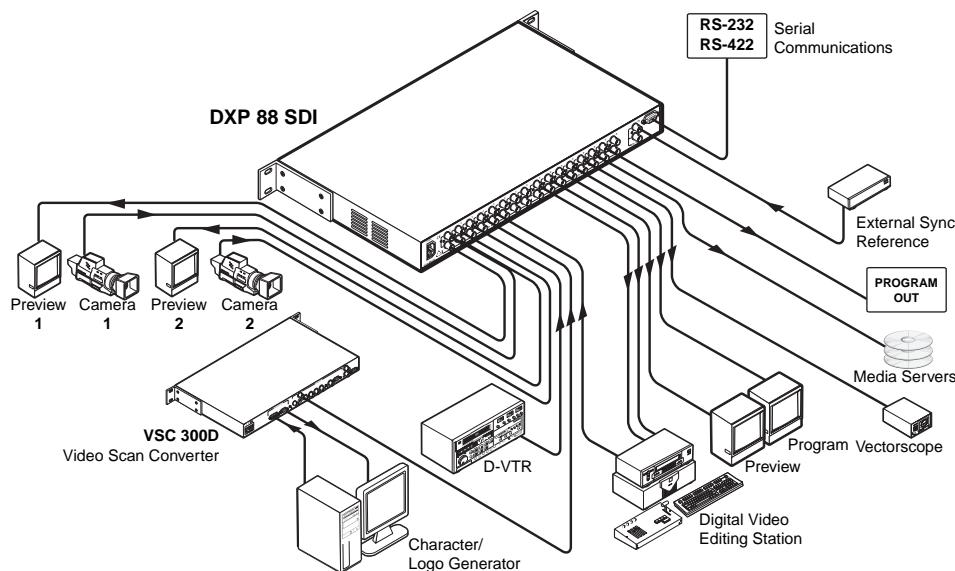


Figure 1-1 — Typical Digital XPoint Switcher application

The switcher has an RS-232/422 port for local control. The switcher can be controlled via the front panel or using the Extron Simple Instruction Set™ (SIS™) and/or Extron's Windows-based control program via the RS-232/422 link.

The Digital XPoint Series Matrix Switchers are housed in rack-mountable, 1U high, 17.5" (44.5 cm) wide metal enclosures. With the included mounting brackets, the switchers can be rack mounted, mounted under a desk or table, or mounted against a wall or the side of a desk. Each model has an internal 100VAC to 240VAC, 50/60 Hz, 40 watt power supply that provides worldwide power compatibility.

Features

Inputs — 4 or 8 SDI video inputs on BNC connectors and 4 or 8 equalized and buffered loop-throughs on BNC connectors

Outputs — 4 or 8 SDI video outputs with two buffered and equalized outputs each on BNC connectors

Serial digital data rates from 143 Mb/s to 360 Mb/s — Capable of switching signals in 4fsc (composite) or 4:2:2 (component) serial digital video transmission standards

Society of Motion Picture and Television Engineers (SMPTE) 259M SDI standard compliance

Automatic input cable equalization — Each input signal is equalized: a 270 Mb/s input signal is equalized for distances of 1000 feet (305 meters) on high quality cable such as Extron SuperFlex SHR Super High Resolution coaxial cable.

Automatic rate selection — The Digital XPoint automatically accepts four SMPTE data rates, including 143 Mb/s, 177 Mb/s, 270 Mb/s, and 360 Mb/s. The auto rate selection is ideal for multi-rate serial data protocols because the switcher automatically detects and locks onto the incoming data signal.

Output data muting when the input source is lost — An internal muting function forces the serial data outputs to a static state when input data is not present or not locked.

16 global memory presets — 16 memory presets are a time-saving feature that lets you set up and store input/output configurations in advance and then recall those configurations with a few simple steps when needed.

Operational flexibility — Operations such as input/output selection and setting of presets can be performed on the front panel or over the RS-232/RS-422 link. The RS-232/RS-422 link allows remote control via a PC or control system.

- **Front Panel Controller** — The Digital XPoint Series front panel controller supports touch-of-a-button input and output selection and preset creation and selection. The front panel features large, positive touch, illuminated pushbuttons that can be labeled with text or graphics.
- **Windows-based control program** — Extron's Windows-based control program provides a versatile range of operational options with its graphical interface and drag-and-drop/point-and-click operation. The Windows-based control program also has an emulation mode that lets you create a switcher configuration file at the home office and then download it for use by the switcher on site.
- **Simple Instruction Set (SIS)** — The remote control protocol uses Extron's SIS for easy programming and operation.

Input carrier detection — When input data is locked, the DXP indicates the presence of a carrier source. This information is available via the RS-232/RS-422 port and either the Windows-based control program or an SIS command.

Remote control — The Digital XPoint switchers are remote controllable, using the MKP 1000 master control keypad and any combination of MCP 1000 slave control panels and/or MKP 1000 slave control keypads. The remote control devices are easy to use and provide tactile buttons for quick selection. Each MCP 1000 can be used for one-touch switching for a particular output and for selecting global presets. Each MKP 1000 dedicated to an output can be used to select a different input for that output or to select a preset.

Introduction, cont'd

LCD display — The LCD displays the I/O configuration, preset configurations, and the status of additional system features.

Mounting flexibility — Mounting brackets make the 1U high switchers mountable in any conventional 19" (48 cm) wide rack, or under or through a desk or other furniture.

Power supply — The 100 VAC to 240 VAC, internal power supply of the Digital XPoint Series provides worldwide power compatibility.



Digital XPoint Matrix Switchers

2

Chapter Two

Installation

Mounting the Switcher

Cabling and Rear Panel Views

Installation

Mounting the Switcher

The Digital XPoint Matrix Switcher comes with two sets of mounting brackets. One set is for mounting the switcher under a table or against a wall, and the other set is for rack mounting.

Table or wall mounting

The table/wall mounting brackets extend approximately 1/4" (6.4 mm) above the top surface of the switcher enclosure. This design allows for an air space between the enclosure and the surface to which it is mounted. Table or wall mount the switcher as follows:

1. Attach the table/wall mounting brackets to the switcher with the eight provided #8 machine screws (figure 2-1).
2. Hold the switcher with the attached brackets against the underside of the table or other furniture, or against the wall. Mark the location of the screw holes of the bracket on the mounting surface.
3. Drill 3/32" (2 mm) diameter pilot holes, 1/4" (6.4 mm) deep in the mounting surface at the marked screw locations.
4. Insert #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until just less than 1/4" of the screw protrudes.
5. Align the mounting screws with the slots in the brackets and place the switcher against the surface, with the screws through the bracket slots.
6. Slide the switcher slightly forward or back, then tighten all four screws to secure the switcher in place.

Rack mounting

UL requirements

The following Underwriters Laboratories (UL) requirements pertain to the installation of the matrix switcher into a rack (figure 2-1).

1. **Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
2. **Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. **Reliable earthing (grounding)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Mounting instructions

Rack mount the switcher as follows:

1. Attach the rack mounting brackets to the switcher with the eight provided #8 machine screws (figure 2-1).

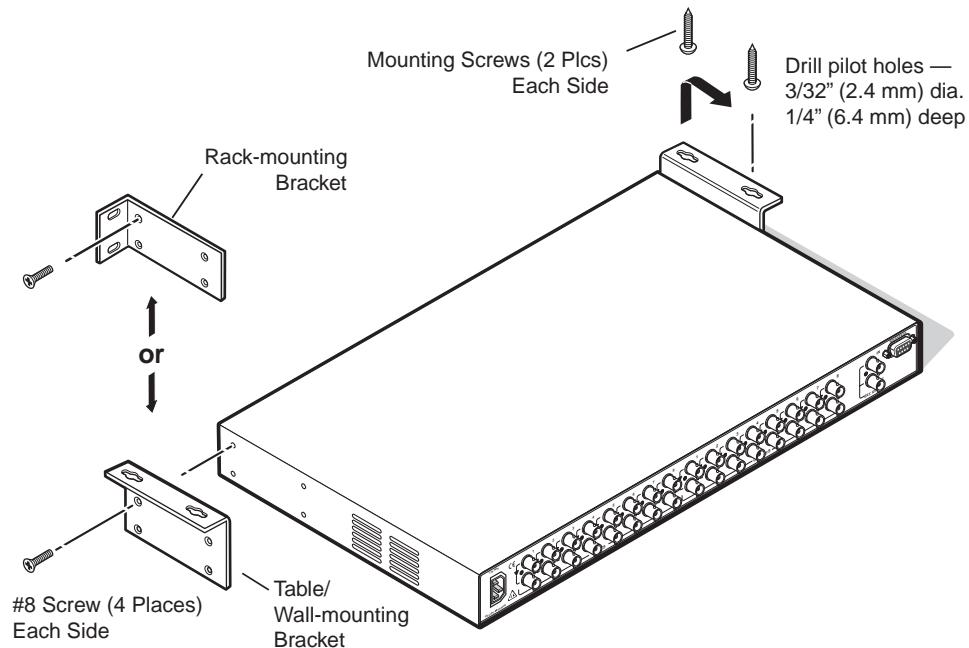


Figure 2-1 — Mounting the Digital XPoint Switcher

2. Insert the switcher into the rack, aligning the holes in the mounting bracket with those of the rack.
3. Secure the switcher to the rack using the supplied machine screws.

Installation, cont'd

Cabling and Rear Panel Views

All connectors are on the rear panel. Figure 2-2 shows the rear of the Digital XPoint 88 Matrix Switcher. The Digital XPoint 44 is housed in the same 1U enclosure, but has fewer input and output connectors to accommodate the different matrix size that it provides. Figure 2-3 shows the Digital XPoint 44 Matrix Switcher.

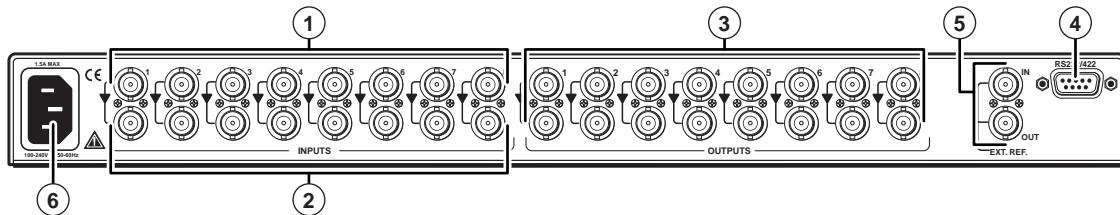


Figure 2-2 — Rear panel connectors, DXP 88 SDI

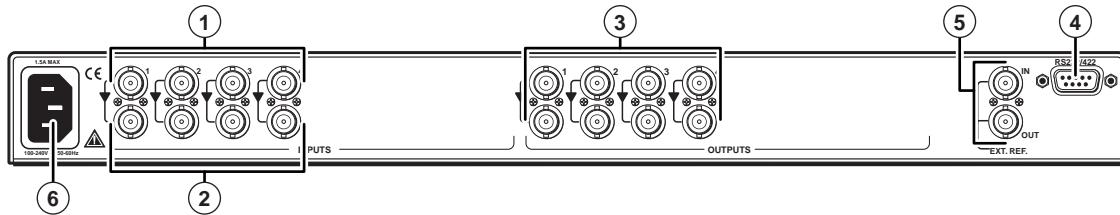


Figure 2-3 — Rear panel connectors, DXP 44 SDI

Digital video input and output connections

NOTE All video input and output connections to the Digital XPoint Switchers are made with female BNC connectors. Some types of video output devices do not have BNC video output connectors. For these cases, a suitable cable or connector adapter is necessary between the device output connector and the BNC input connector of the Digital XPoint.

- ① **Input in (top) video connectors** — Connect an SDI input device to these female BNC connectors.
- ② **Input loop-through (bottom) video connectors** — Connect an SDI display or other device to these female BNC connectors. The switcher outputs an equalized SDI loop-through on these BNCs.

NOTE The Digital XPoint Matrix Switchers equalize the output signals and the loop-through signals. Beyond that, they do not alter the video signal in any way. The signal output by the switcher is in the same format as the input.

- ③ **Output video connectors** — Connect an SDI display or other device to these female BNC connectors. The switcher outputs two identical, equalized SDI signals for each output number.

RS-232/422 connection

④ **RS-232/RS-422 port** — If desired, connect a host device, such as a computer or touch panel control, to the Digital XPoint via this 9-pin D connector for serial RS-232/RS-422 control (figure 2-4).

Pin	RS-232 Function	RS-422 Function
1	—	TX- Transmit data (-)
2	TX Transmit data	TX+ Transmit data (+)
3	RX Receive data	RX+ Receive data (+)
4	—	RX- Receive data (-)
5	Gnd Signal ground	Gnd Signal ground
6	—	— Not used
7	—	— Not used
8	—	— Not used
9	—	— Not used

Figure 2-4 — RS-232/RS-422 port pin assignments

See chapter 4, “Programmer’s Guide”, for definitions of the SIS commands and chapter 5, “Matrix Software”, to install and use the control software.

NOTE *The Digital XPoint Series Matrix Switchers are factory configured for RS-232 control. To use the switcher under RS-422 control, an internal cable must be moved. See chapter 6, “Maintenance and Modifications”, for the procedure for swapping the serial ports.*

If desired, connect an MCP 1000 remote control panel master unit to the switcher’s RS-232/RS-422 connector. You can also connect an MKP 1000 remote keypad or MCP 1000 slave unit to the MCP 1000 master unit. Refer to the *MCP 1000 Remote Control Panel User’s Manual*, part #68-456-01, and the *MKP 1000 User’s Manual*, part #68-355-01, for details.

External sync connection

When switching between inputs, the resulting image change should be seamless, or clean. The Digital XPoint Switchers can use an external signal to synchronize switching during the vertical sync interval. Without the external sync locking feature, switching between inputs can result in a brief rolling (sync loss) or a brief change in the picture size.

⑤ **External Reference In (top) connector** — Connect an external sync signal to this BNC connection for genlocking the video signal in broadcast or other sync-critical applications.

External Reference Out (bottom) connector — Connect any downstream equipment that requires genlocking to this BNC connector to route the external sync signal throughout the system in broadcast or other sync-critical applications.

Figure 2-5 shows a basic external sync configuration. The External Reference In connector receives a timing signal. The External Reference Out connector allows the signal to be passed on to another video device, if required.

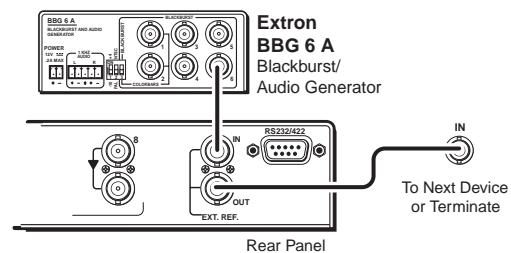


Figure 2-5 — Simple external sync connection example

Installation, cont'd

Figure 2-6 shows a configuration in which the timing signal passes through three video cameras before connecting to the switcher. This type of video camera is capable of synchronizing with the external timing source for video editing applications.

If no external sync timing source is connected to the switcher, switching occurs immediately rather than during the next vertical sync interval.

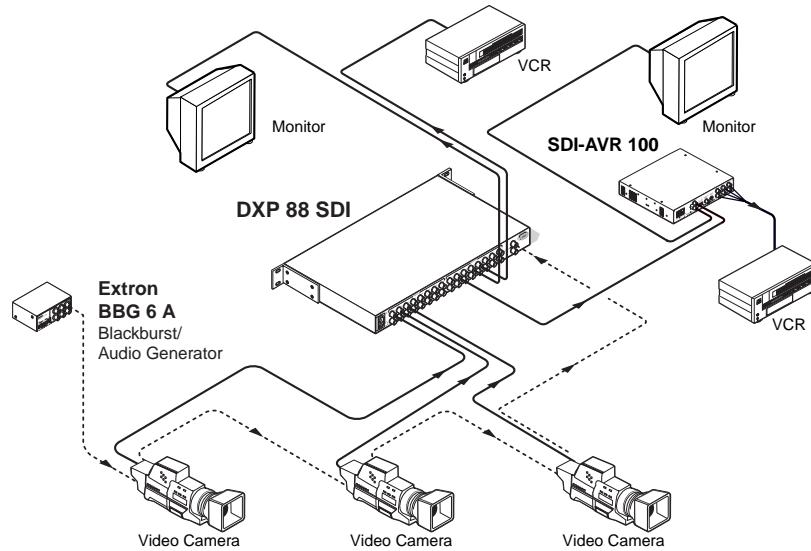


Figure 2-6 — Multiple device external sync connection example

Power connection

- ⑥ **AC power connector** — Plug a standard IEC power cord into this connector to connect the switcher to a 100 to 240 VAC, 50 Hz or 60 Hz power source.



Digital XPoint Matrix Switchers

3

Chapter Three

Operation

Front Panel Controls and Indicators

Front Panel Operations

Worksheets

Operation

Front Panel Controls and Indicators

All Digital XPoint controls and indicators are on the front panel (figure 3-1). The large, illuminated push buttons can be labeled with text and/or graphics. The buttons can be set to provide amber background illumination all the time or the background illumination can be set to off. The buttons blink or are fully illuminated (depending on the operation) when selected. The 8x2 character LCD indicates the current I/O configuration, preset configurations, the input detection, and the status of additional system features.

NOTE *Figure 3-1 shows the DXP 88 SDI. The DXP 44 SDI is identical, with the exception of fewer input and output buttons. The function of the DXP 44 SDI is identical, with the exception of the preset number assignments.*

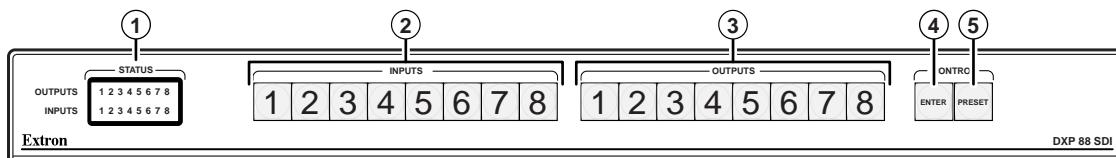


Figure 3-1 — Digital XPoint 88 SDI front panel

Definitions

The following terms apply to Extron matrix switchers, and are used throughout this manual:

Tie — An input-to-output connection.

Set of ties — An input **tied** to two or more outputs. (An output can never be **tied** to more than one input.)

Configuration — May consist of one **tie** or one or more **sets of ties**.

Current configuration — The **configuration** that is currently being used (also called **configuration 0**)

Global memory preset — A **configuration** that has been stored. Up to 16 **global memory presets** can be stored in memory. The input and output buttons select the desired **preset** memory location to load or retrieve a **preset**. When a **preset** is retrieved from memory, it becomes the **current configuration**. One **preset** can be assigned to each input and output button. On the DXP 44 SDI, **presets** 9 through 16 can only be stored and retrieved via the RS-232/RS-422 link.

LCD display

① **Status display** — The 8-column by 2-line Status LCD displays the I/O configuration, preset configurations, and the status of additional system features.

Input buttons and output buttons

② **Input 1 through 8 buttons** — The input buttons have three independent functions: to select an input, to select a preset, and to identify the selected inputs. A more detailed explanation of these functions is included in “Front Panel Operations”, beginning on page 3-3.

③ **Output 1 through 8 buttons** — The output buttons have three independent functions: to select an output, to select a preset, and to identify the selected outputs. A more detailed explanation of these functions is included in “Front Panel Operations”, beginning on page 3-3.

Control buttons

- ④ **Enter button** — The Enter button saves changes when you set up a new configuration. To create a simple configuration, press the desired input button ①, press the desired output button(s) ②, and press the Enter button.
- ⑤ **Preset button** — The Preset button saves a configuration as a preset or recalls and makes current a previously defined preset. The Preset button indicates the save preset mode when it is blinking and the recall preset mode when it lights steadily.

Button icons

The translucent covers on the pushbuttons can be removed and replaced to insert labels behind the covers.

Input and output labels can be created easily with Extron's Button Label Generator software, which ships with every Extron matrix switcher. Each input and output can be labeled with names, alphanumeric characters, or even color bitmaps for easy and intuitive input and output selection (figure 3-2). See chapter 5, "Matrix Software", for details on using the labeling software. See chapter 6, "Maintenance and Modifications", for blank labels and procedures for removing and replacing the translucent covers.

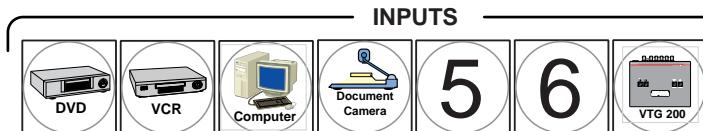


Figure 3-2 — Sample button icons

Front Panel Operations

The following paragraphs detail the power-up process and provide sample procedures for creating ties, sets of ties, and configurations; changing a configuration; viewing ties, sets of ties, and configurations; saving a preset; and recalling a preset.

Power

Power is automatically applied when the power cord is connected to an AC source. When AC power is applied, the switcher performs a self-test that cycles the front panel button indicators on and off from left to right lit green, right to left lit red, and left to right lit amber. The self-test also displays the model name and the firmware version in the LCD display. After approximately 2 seconds, the LCD reverts to its default display, Extron DXP 88 (or Extron DXP 44) (figure 3-3). An error-free power up self-test sequence leaves all of the button indicators off or background illuminated and the LCD displaying the default display.

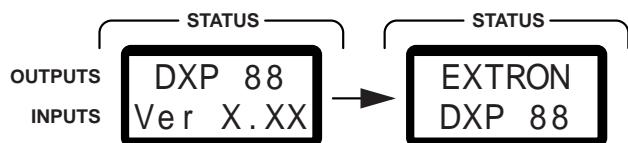


Figure 3-3 — LCD power up and default displays

Operation, cont'd

The current configuration and all presets are saved in non-volatile memory. When power is applied, the last current configuration is retrieved. The previous presets remain intact.

If an error occurs during the self-test, the switcher locks up and will not operate. If your switcher locks up on power-up, call the Extron S³ Sales & Technical Support Hotline.

Switch modes

The Digital XPoint switchers have two switching modes:

- The *enter* switch mode, in which selected switch changes take effect only after you press the Enter button.
- The *quick* switch mode, in which the changes take place on the fly, as you select them, without the need to press the Enter button.

NOTE *The switch mode, quick or enter, is for ties only and has no effect on saving and recalling presets.*

The current switch mode can be determined by pressing and releasing an output button. In the *enter* switch mode, output buttons light or blink green when selected. In the *quick* switch mode, the output buttons light red. After approximately 10 seconds, the buttons return to either unlit or to background illumination.

Toggle between the two modes as follows (figure 3-4):

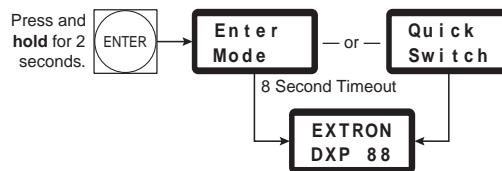


Figure 3-4 — Changing switch mode

1. Press and **hold** the Enter button for approximately 2 seconds.
2. The LCD displays one of two messages: either Enter Mode or Quick Switch.
3. After approximately 8 seconds, the LCD returns to the default display.

Creating a configuration

The current configuration can be changed using the front panel buttons. To change the current configuration, do the following:

1. Select the desired input and the desired output(s) by pressing the input and output buttons.
To clear unwanted outputs, press and release the associated lit output buttons.
In the *quick* switch mode, the tie is created immediately.
2. If in the *enter* switch mode, press and release the Enter button.
3. Repeat steps 1 and 2 to create additional ties until the desired configuration is complete.

NOTE

1. Only one video input can be tied to an output, but multiple outputs can be tied to a single input.
2. If a tie is made between an input and an output, and the selected output was previously tied to another input, the older tie is broken in favor of the newer tie.
3. To indicate current ties, the associated input button lights green (both modes) and all the associated output buttons light green (enter switch mode) or red (quick switch mode) when either an input or output button is selected.
4. If an input with no tie is selected, only that input's button lights green.
5. In enter switch mode, as each output is selected, the associated output button blinks green to indicate a tentative tie. Buttons for output(s) that were already tied to the input light green steadily. Outputs that are already tied can be left on, along with new blinking selections, or toggled off by pressing the associated output button.

Example 1a: Create a set of ties in enter switch mode

The following steps show an example in which input 5 is tied to outputs 3, 4, and 8 in *enter switch mode*. Each step shows the front panel indications that result from your action.

NOTE

This example assumes that there are no ties in the current configuration.

1. Press and release the Input 5 button (figure 3-5).

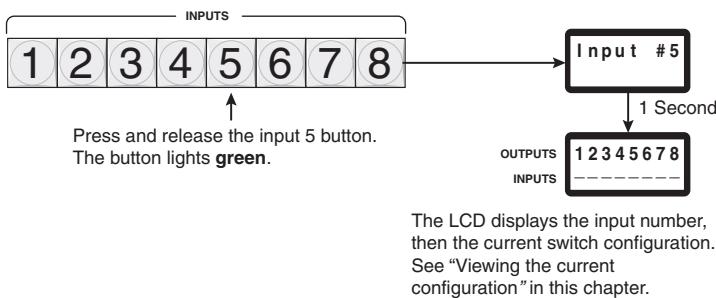


Figure 3-5 — Select an input

2. Press and release the Output 3, Output 4, and Output 8 buttons (figure 3-6).

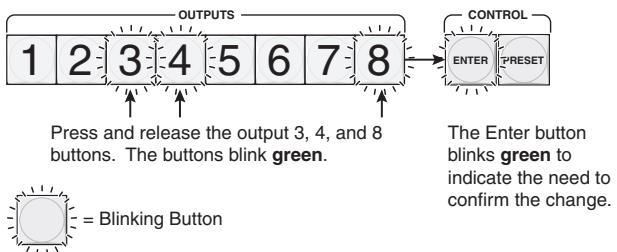


Figure 3-6 — Select outputs

Operation, cont'd

3. Press and release the Enter button (figure 3-7). The input, output, and Enter buttons return to either unlit or to background illumination. The LCD returns to the default display. The current configuration is now defined as input 5 tied to output 3, output 4, and output 8.

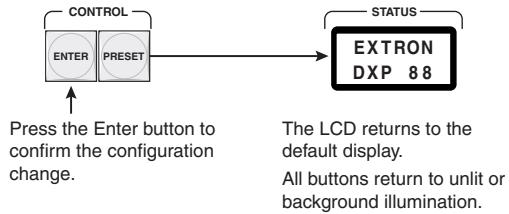


Figure 3-7 — Press Enter

Example 1b: Create a set of ties in quick switch mode

The following steps show an example in which input 5 is tied to outputs 3, 4, and 8 in *quick* switch mode. Each step shows the front panel indications that result from your action.

NOTE *This example assumes that there are no ties in the current configuration.*

1. Press and release the input 5 button (figure 3-8).

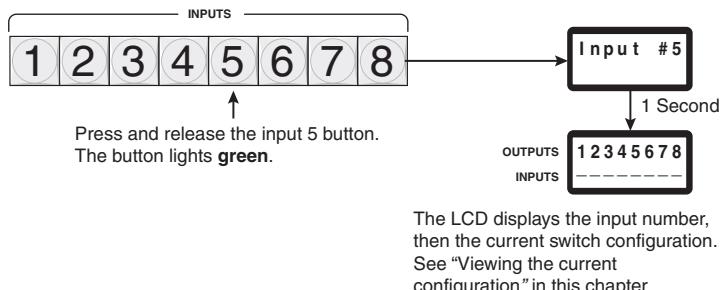


Figure 3-8 — Select an input

2. Press and release the output 3, output 4, and output 8 buttons (figure 3-9). The output 3, output 4, and output 8 buttons light red as they are pressed to indicate a created tie. The current configuration is now defined as input 5 tied to output 3, output 4, and output 8.

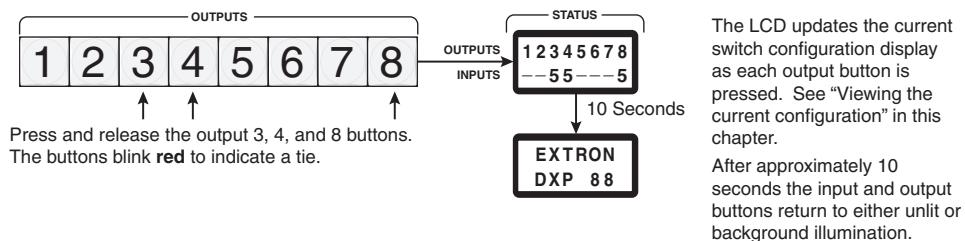


Figure 3-9 — Select outputs to create ties in quick switch mode

Example 2: Add a tie to a set of ties

The following steps show an example in which a new video tie is added to the current configuration in enter switch mode. Each step shows the front panel indications that result from your action.

NOTE *This example assumes that the switcher is in enter switch mode. If the switcher is in the quick switch mode, output buttons light red rather than green and the step in which the Enter button is pressed is not necessary.*

1. Press and release the input 5 button (figure 3-10). If the steps in Example 1 have been completed, the output 3, output 4, and output 8 buttons indicate ties created in Example 1.

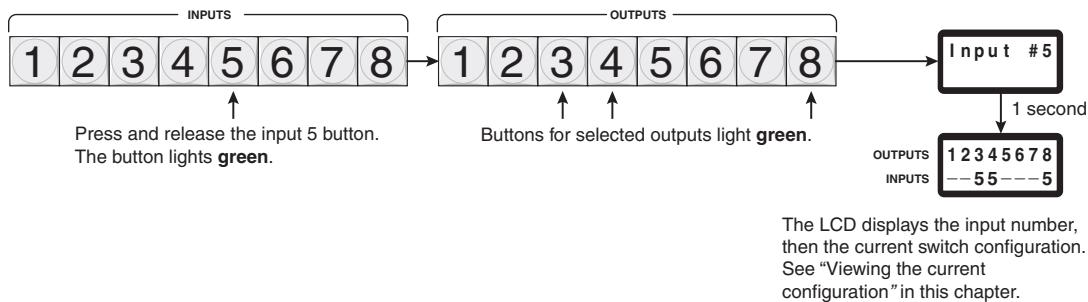


Figure 3-10 — Select an input

2. Press and release the output 1 button (figure 3-11).

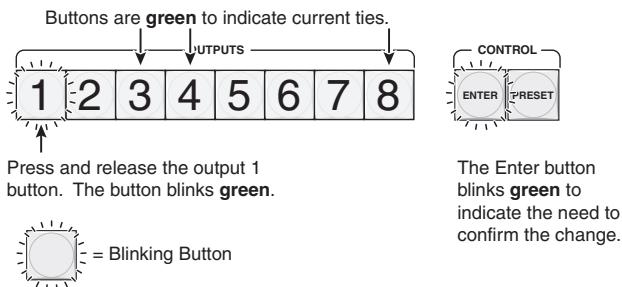


Figure 3-11 — Select a new input

3. Press and release the Enter button (figure 3-12). The input, output, and Enter buttons return to either unlit or to background illumination. The LCD returns to the default display. The current configuration is now defined as input 5 tied to output 1, output 3, output 4, and output 8.

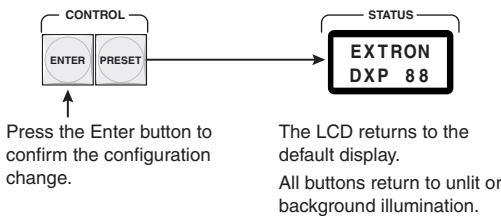


Figure 3-12 — Press Enter

Operation, cont'd

Example 3: Remove a tie from a set of ties

The following steps show an example in which an existing tie is removed from the current configuration in *enter* switch mode. Each step shows the front panel indications that result from your action.

NOTE *This example assumes that the switcher is in enter switch mode. If the switcher is in the quick switch mode, output buttons light red and the step in which the Enter button is pressed is not necessary.*

1. Press and release the input 5 button (figure 3-13). If the steps in Example 1 have been completed, the output 1, the output 3, output 4, and output 8 buttons indicate ties already created.

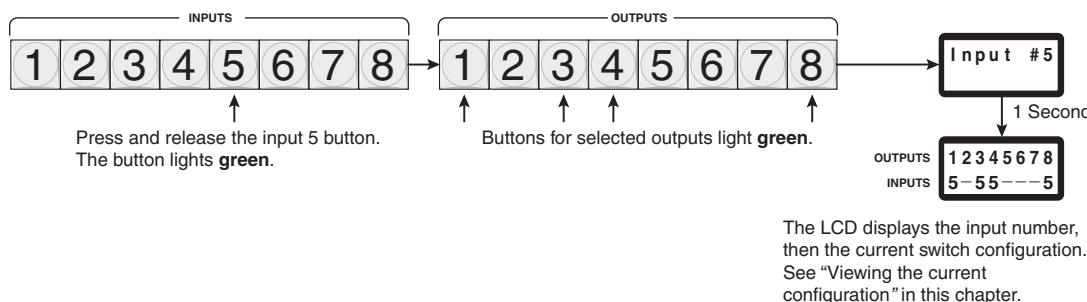


Figure 3-13 — Select an input

2. Press and release the output 4 button (figure 3-14). The output 4 button returns to either unlit or to background illumination, while the output 1, output 3, and output 8 buttons remain lit green. The Enter button blinks to indicate that a potential change to the configuration needs to be confirmed.

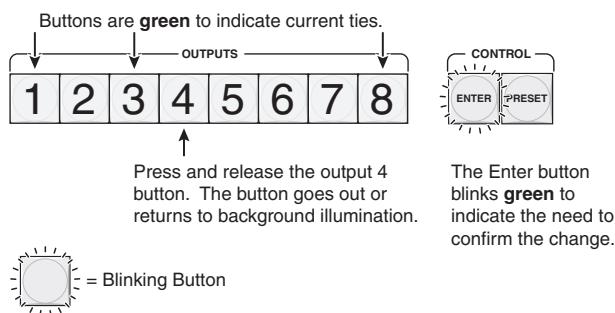


Figure 3-14 — Deselect an input

3. Press and release the Enter button (figure 3-15). The input, output, and Enter buttons return to either unlit or to background illumination. The LCD returns to the default display. The current configuration is now defined as input 5 tied to output 1, output 3, and output 8.

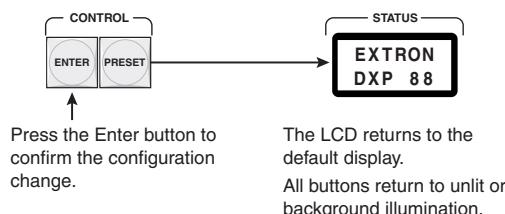


Figure 3-15 — Press Enter

Viewing the current configuration

The LCD can display the current configuration for a specific input. To view the current configuration for an input, press and release the input button for that input. The LCD displays the current configuration (figure 3-16) before returning to the default display.

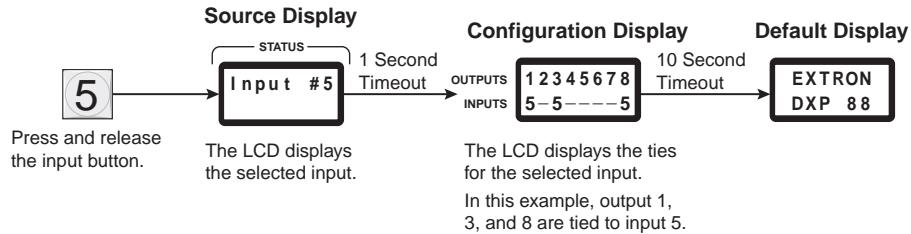


Figure 3-16 — LCD configuration display

The LCD configuration message displays each output number on the top line and the tied inputs on the bottom line. Figure 3-16 shows the LCD display cycle that results after the steps in example 1, example 2, and example 3 have been completed.

Using presets

The current configuration (configuration 0) can be saved as a preset in any of 16 preset memory addresses. On the DXP 88 SDI, presets 1 through 8 are assigned to the input buttons 1 through 8, and presets 9 through 16 are assigned sequentially to output buttons 1 through 8 (figure 3-17). On the DXP 44 SDI, presets 1 through 4 are assigned to input buttons 1 through 4 and presets 5 through 8 are assigned to output buttons 1 through 4.

All presets, including DXP 44 SDI presets 9 through 16, which are not available from the front panel, can be stored and retrieved via the RS-232/RS-422 link.

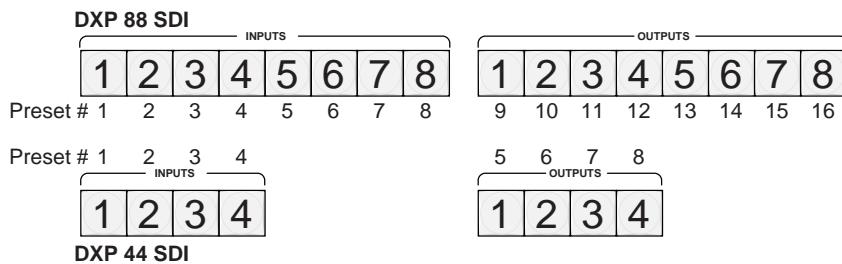


Figure 3-17 — Presets assignment to input and output buttons

NOTE

1. The current configuration and all presets are stored in non-volatile memory. When power is removed and restored, the current configuration is still active and all presets are retained.
2. When a preset is recalled, it replaces the current configuration, which is lost unless it is also stored as a preset. The recalled preset overwrites all of the current configuration ties in favor of the preset configuration ties.

Operation, cont'd

Example 4: Save a preset

The following steps show an example in which, on a DXP 88 SDI, the current configuration is saved as a preset. Each step shows the front panel indications that result from your action.

NOTE *The switch mode, quick or enter, is for ties only and has no effect on saving presets.*

1. Press and **hold** the Preset button for approximately 2 seconds (figure 3-18).

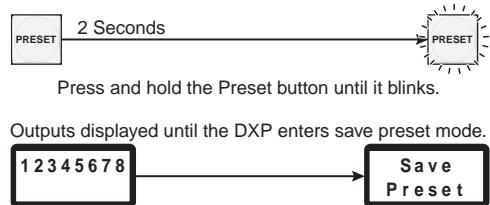


Figure 3-18 — Selecting save preset mode

2. Press and release the output 1 button (figure 3-19).

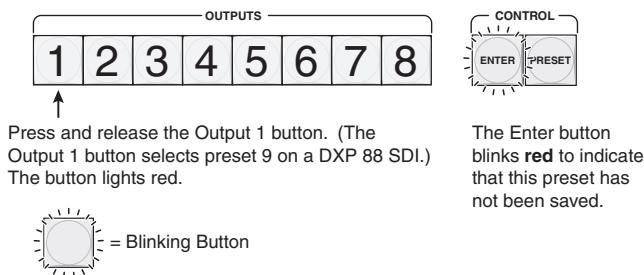


Figure 3-19 — Selecting the preset

3. Press and release the Enter button (figure 3-20). The Preset button returns to either unlit or to background illumination. The LCD returns to the default display. The active configuration is now saved as preset 9 (DXP 88 SDI) or preset 5 (DXP 44 SDI).

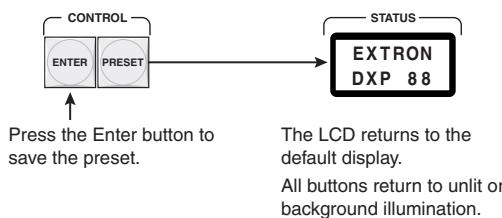


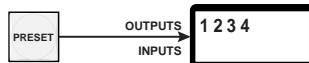
Figure 3-20 — Press Enter

Example 5: View or recall a preset

The following steps show an example in which, on a DXP 44 SDI, the configuration of a saved preset is shown in the LCD and then recalled to become the current configuration. Each step shows the front panel indications that result from your action.

NOTE *The switch mode, quick or enter, is for ties only and has no effect on recalling presets.*

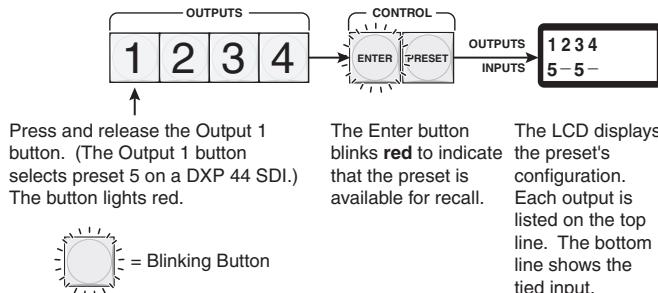
1. Press and release the Preset button (figure 3-21).



Press and release the Preset button. The LCD displays the outputs. The tied inputs are not shown until you select a preset.

Figure 3-21 — Selecting view/recall preset mode

2. Press and release the Output 1 button (figure 3-22).



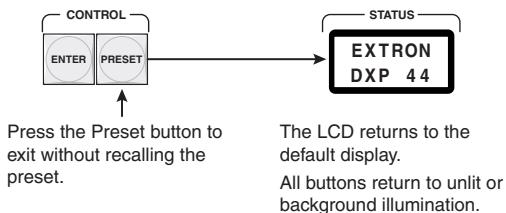
Press and release the Output 1 button. (The Output 1 button selects preset 5 on a DXP 44 SDI.) The button lights red.

The Enter button blinks red to indicate that the preset is available for recall.

The LCD displays the preset's configuration. Each output is listed on the top line. The bottom line shows the tied input.

Figure 3-22 — Selecting the preset

3. To view a different preset, press and release a different input or output button.
4. To stop viewing presets without recalling a preset, press and release the Preset button (figure 3-23).

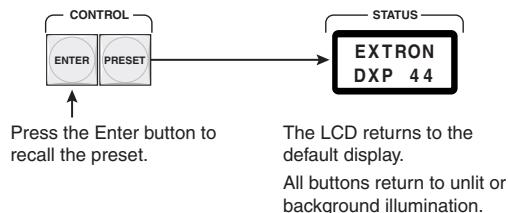


Press the Preset button to exit without recalling the preset.

The LCD returns to the default display. All buttons return to unlit or background illumination.

Figure 3-23 — Press Preset to exit

5. To recall the preset, press and release the Enter button (figure 3-24). The configuration stored in memory location 5 is now the current configuration.



Press the Enter button to recall the preset.

The LCD returns to the default display. All buttons return to unlit or background illumination.

Figure 3-24 — Press Enter to recall

Operation, cont'd

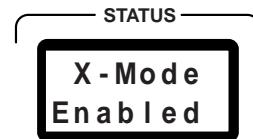
Background illumination

The buttons on the front panel can be set to provide amber background illumination at all times or the background illumination can be turned off. To toggle the background illumination on or off, press and hold the Input 1 and Input 2 buttons for approximately two seconds.

Executive mode (front panel security lockout)

The executive mode limits the operation of the Digital XPoint switcher from the front panel. When the switcher is in executive mode, all of the front panel functions are disabled except for the ability to toggle background illumination on and off. See "Background illumination" above.

To toggle executive mode on or off, press and hold the Enter and Preset buttons for approximately two seconds. When the switcher enters executive mode, the LCD displays X-Mode Enabled for approximately 8 seconds. The LCD also displays X-Mode Enabled when a front panel button is pressed while the switcher is in executive mode. When the switcher exits executive mode, the LCD displays X-Mode Disabled. Release the Enter and Preset buttons. To toggle the executive mode state again, press and hold the Enter and Preset buttons again.



System reset to factory defaults

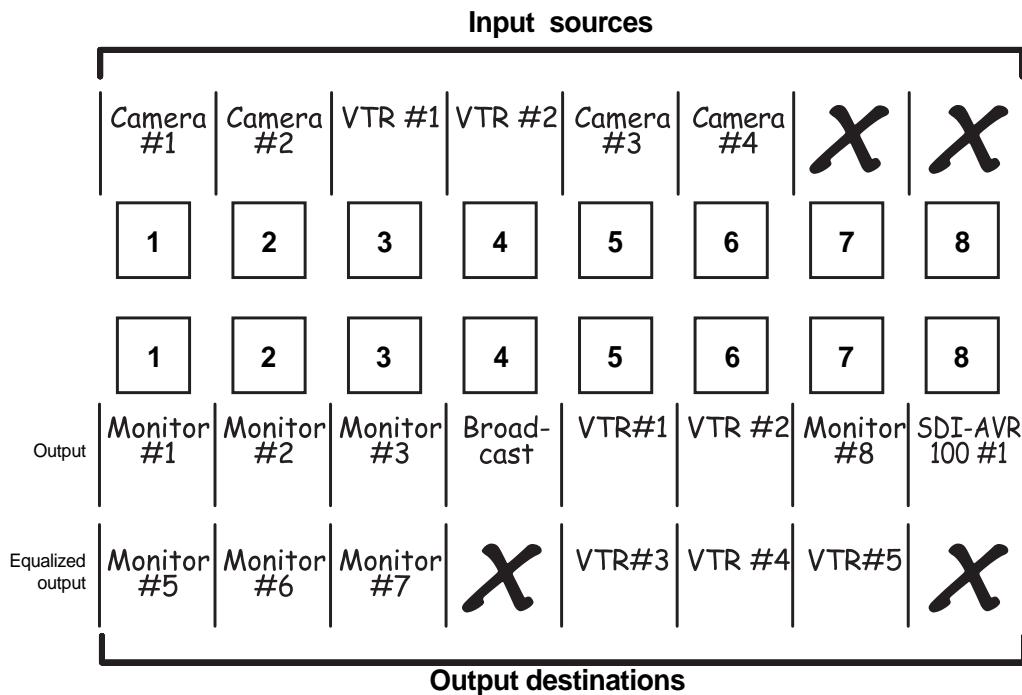
To reset the switcher to the factory default settings, press and hold the Enter button on the front panel while you plug in the switcher. Continue to hold the Enter button until the power up sequence is completed (all front panel buttons cycle on and off from left to right lit green, right to left lit red, and left to right lit amber). System reset clears all ties and presets, background illumination, and the executive mode to the factory defaults.

Worksheets

Rather than trying to remember the configuration for each preset, use worksheets to record this information. Make copies of the blank worksheet on page 3-17 and use one for each preset configuration. The form accommodates all of the Digital XPoint models. Cross off all unused or inactive inputs and outputs.

Worksheet example 1: Entering system equipment

Figure 3-25 shows a worksheet for a Digital XPoint 88 SDI at a fictional cable TV station. The system hardware is annotated on the worksheet. Inputs 7 and 8 and equalized outputs 4 and 7 have no connections, so they have been crossed out on the worksheet. On this example, preset 1 is used for the normal broadcast mode. Choose your own method of notation.



Preset # 1 Title: Broadcast mode A

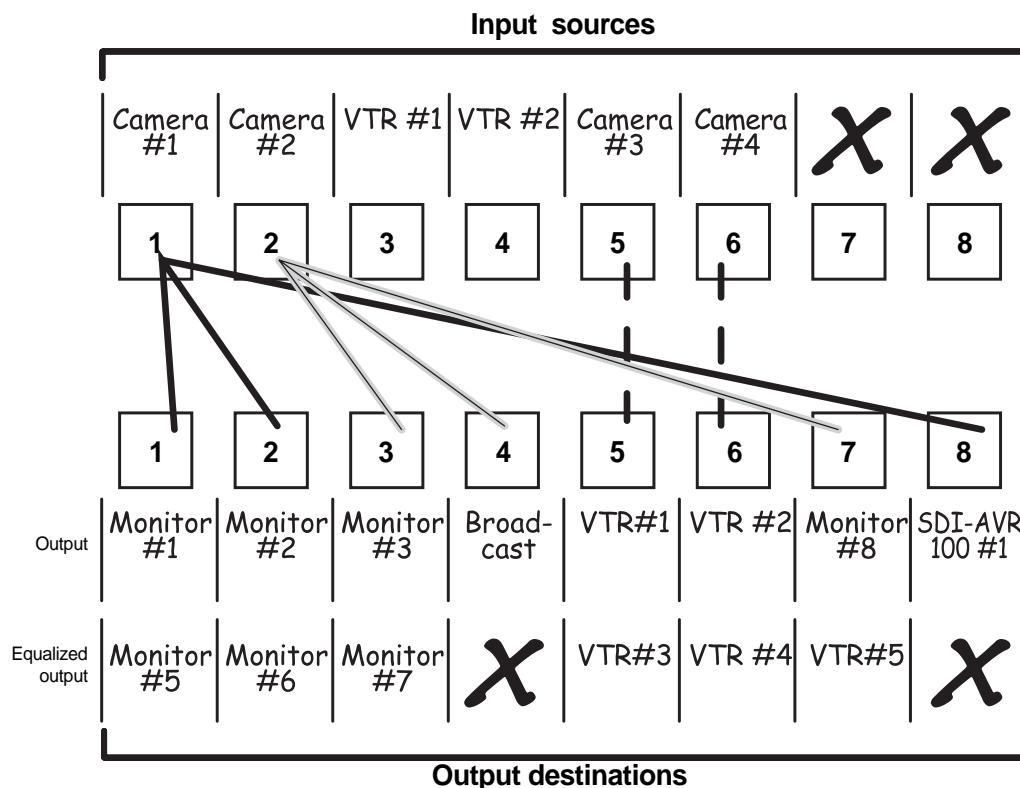
Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

Figure 3-25 — Worksheet example 1: System equipment

Operation, cont'd

Worksheet example 2: Drawing ties

Figure 3-26 continues from worksheet example 1 by showing the video ties that make up the configuration of preset 1. A solid ink line shows video ties from camera 1, a pencil line shows ties from camera 2, and dashed lines show the ties from cameras 3 and 4.



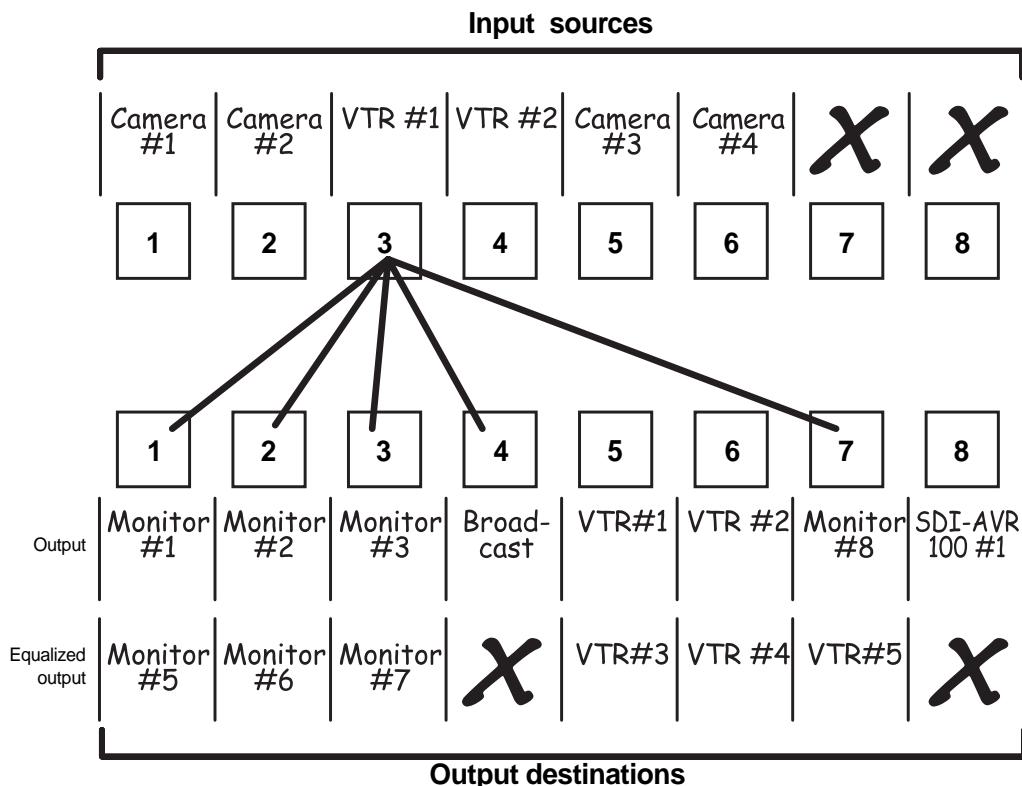
Preset # 1 Title: Broadcast mode A

Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

Figure 3-26 — Worksheet example 2: Sample configuration

Worksheet example 3: Test configuration

At night, the cable TV station in our fictional organization broadcasts a test pattern and sends the staff home. Figure 3-27 shows the test pattern configuration, with a test pattern from the VTR generated to all monitors (outputs 1, 2, 3, and 7) and to the broadcast equipment (output 4).



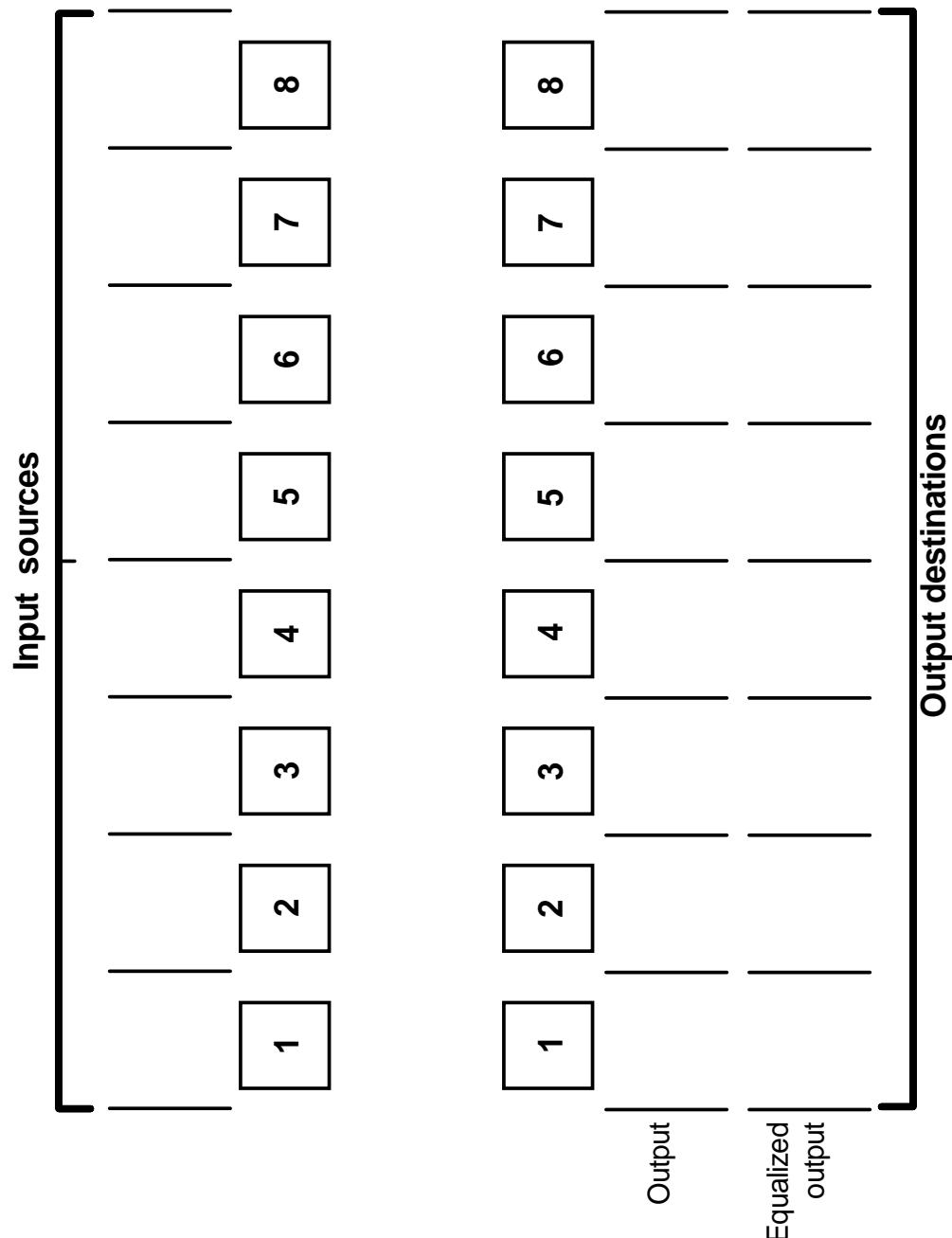
Preset # 2 Title: Test pattern

Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

Figure 3-27 — Worksheet example 3: Test configuration

Operation, cont'd

Configuration worksheet



Preset # Title:
Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

Operation, cont'd



Digital XPoint Matrix Switchers

4

Chapter Four

Programmer's Guide

Host-to-Switcher Instructions

Switcher-Initiated Messages

Switcher Error Responses

Using the Command/Response Table

Command/Response Table for SIS Commands

Programmer's Guide

The switcher's rear panel RS-232/422 9-pin D female connector (figure 4-1) can be connected to the RS-232 or RS-422 serial port output of a host device such as a computer running the HyperTerminal utility, an RS-232 capable PDA, or a control system. This connection makes software control of the switcher possible.

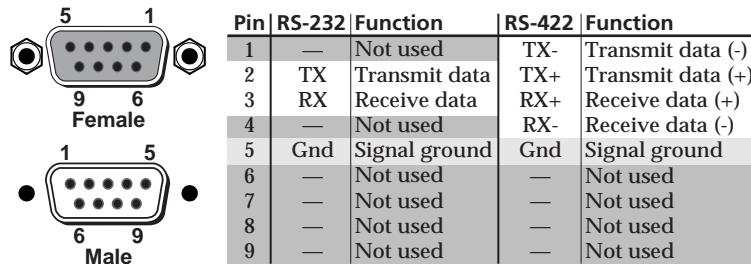


Figure 4-1 — Remote connector pin arrangement

The protocol is as follows:

- 9600 baud
- no parity
- 8-bit, 1 stop bit
- no flow control

NOTE If your Digital XPoint Series switcher was previously set up for RS-232, and your computer comm port uses RS-422, you must change the switcher cabling to match the computer interface. See chapter 6, Maintenance and Modifications, for the procedure for swapping the serial ports.

Host-to-Switcher Instructions

The switcher accepts SIS (Simple Instruction Set) commands through the RS-232/RS-422 port and Ethernet port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each switcher response to an SIS command ends with a carriage return and a line feed (CR/LF = ↴), which signals the end of the response character string. A string is one or more characters.

Switcher-Initiated Messages

When a local event such as power-up or a front panel operation occurs, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below (underlined).

(C) Copyright 2001, Extron Electronics "DXP88", Vx.xx ↴

The copyright message is initiated by the switcher when it is first powered on. Vx.xx is the firmware version number.

↳ Password:

The switcher initiates the password message immediately after the copyright message when the controlling system is connected using TCP/IP or Telnet and the switcher is password protected. This message means that the switcher requires an administrator or user level password before it will perform the commands entered via this link. The switcher repeats the password message response for every entry other than a valid password until a valid password is entered.

↔ Login Administrator ↔

↔ Login User ↔

The switcher initiates the login message when a correct administrator or user password has been entered. If the user and administrator passwords are the same, the switcher defaults to administrator privileges.

Reconfig ↔

The reconfig message is initiated by the switcher when a front panel operation has occurred, an audio gain adjustment has been completed, or a memory preset has been recalled.

All Configuration Memory Cleared ↔

The memory cleared message is initiated by the switcher when a system reset has occurred. See *System reset to factory defaults* in chapter 3.

The switcher does not expect a response from the host, but the host program might request a new status.

Switcher Error Responses

When the switcher receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the switcher is unable to perform the command because the command is invalid or contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

- E01 — Invalid input channel number (too large)
- E10 — Invalid command
- E11 — Invalid preset number (too large)
- E12 — Invalid output number (too large)
- E14 — Illegal command for this configuration
- E24 — Privilege violation

Using the Command/Response Table

The command/response table begins on the next page. Upper- or lowercase letters are acceptable in the command field. Symbols are used throughout the table to represent variables in the command/response fields. Command and response examples are shown throughout the table.

The table below shows the hexadecimal equivalent of each ASCII command.

ASCII to HEX Conversion Table							
	Esc	1B	CR	0D	LF	0A	
Space 20	!	21	“	22	#	23	\$ 24
(28)	29	*	2A	+	2B	,
Ø 30	1	31	2	32	3	33	4 34
8 38	9	39	:	3A	;	3B	< 3C
@ 40	A	41	B	42	C	43	D 44
H 48	I	49	J	4A	K	4B	L 4C
P 50	Q	51	R	52	S	53	T 54
X 58	Y	59	Z	5A	[5B	\ 5C
‘ 60	a	61	b	62	c	63	d 64
h 68	i	69	j	6A	k	6B	l 6C
p 70	q	71	r	72	s	73	t 74
x 78	y	79	z	7A	{	7B	7C }
							7D ~ 7E DEL 7F

Programmer's Guide, cont'd

Command/Response Table for SIS commands

Symbol definitions

↓	= Carriage return/line feed
←	= Carriage return (no line feed)
•	= Space
x1	= Input number 01 – 04 (Digital XPoint 44 SDI); 01 – 08 (Digital XPoint 88 SDI)
x2	= Output number 01 – 04 (Digital XPoint 44 SDI); 01 – 08 (Digital XPoint 88 SDI)
x3	= Input number (for tie) 0 – maximum number of inputs (0=disconnected)

NOTE *Input and output numbers in commands may be entered as either 1-, 2-, or 3-digit numbers. All input and output numbers are specified as 1-digit numbers in the response.*

x4	= Preset number 00 – 16 (0 = current configuration)
x5	= Preset number 01 – 16
x6	= On/off 1 = on; 0 = off
x7	= Sync 1 = sync detected (signal present); 0 = no sync
x8	= Controller software version number to second decimal place
x9	= Total number of inputs
x10	= Total number of outputs

Command/response table for SIS commands

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Create ties			
Tie input x3 to output x2 , all	$\text{x3} * \text{x2} !$	Out x2 •In x3 •All↓	Video and audio tie. (DXP does not support audio.)
Example:	1*3!	Out3•In1•All↓	Tie input 1 all to output 3.
Tie input x3 to output x2 , video	$\text{x3} * \text{x2} %$	Out x2 •In x3 •Vid↓	
Example:	7*5%	Out5•In7•Vid↓	Tie input 7 video to output 5.
Quick multiple tie	$\text{Esc}+\text{Q} \text{x3} \text{x2}!... \text{x3} \text{x2}! $	Qik↓	
Example:	$\text{Esc}+\text{Q}3*4!3*5!3*6! $	Qik↓	Tie input 3 to outputs 4, 5, and 6.
Tie input to all outputs	x3^*	In x3 •All↓	
Example:	5*!	In05•All↓	Tie input 5 to all outputs.
NOTE	<ul style="list-style-type: none"> The ! video tie command and the % all tie command can be used interchangeably on the Digital XPoint models. Commands can be made back-to-back with no spaces. Example: 1*1!02*02!003*003!... The quick multiple tie and tie input to all outputs commands activate all switches simultaneously. 		
Global presets			
Save current configuration as preset x5 ,	x5 ,	Spr x5 ↓	Command character is a comma.
Example:	9,	Spr09↓	Save current ties as preset 9.
Recall a preset	$\text{x5}.$	Rpr x5 ↓	Command character is a period.
Example:	5.	Rpr05↓	Recall preset 5, which becomes the current configuration.

Command/response table for SIS commands (Cont'd)

Command	ASCII Command (host to switcher)	Response (switcher to host)	Additional description
Direct write of a global preset <i>Example:</i>	<code>[Esc]+[X5]P[X3]*[X2]!...[X3]*[X2]!←</code> <code>[Esc]+7P3*2!5*3!3*6!4*1!←</code>	<code>Spr[X5]←</code> <code>Spr7←</code>	Directly enters a global preset. Creates preset 7, consisting of Input (I) 5 tied to Output (O) 2 and 3, I3 to O6, and I4 to O1.
Executive mode			
Lock front panel	1x	Exe1←	Enable executive mode.
Unlock front panel	0x	Exe0←	Disable executive mode.
Lock status	x	[X6]←	1 = exec mode on, 0 = exec mode off.
Resets			
Reset global presets	<code>[Esc]ZG←</code>	Zpg←	Clear all global presets.
Reset whole switcher	<code>[Esc]XXXX←</code>	Zpx←	Clears all ties, global presets, background illumination, and executive mode.
View ties and presets			
View video output tie <i>Example:</i>	<code>[X2]%</code> 7%	<code>[X3]←</code> 02←	Output 7 video tied to input 2 video.
View preset configuration <i>Example:</i>	<code>[X4]VC</code> 1VC	<code>[X3]•(4 (DXP 44) or 8 (DXP 88) total)•Vid←</code> Response = tied input: <code>4•8•4•6•6•2•0•0•Vid←</code> Output: 1 2 3 4 5 6 7 8	Show preset [X4]'s video configuration. Show the video input tied to 4 or 8 sequential outputs. input # (I#) is assigned to output # (O#)•I# assigned to O#+1...I# assigned to O#+7•Vid← Input 4 tied to output 1 No tied input Response = tied input: 4•8•4•6•6•2•0•0•Vid← Output: 1 2 3 4 5 6 7 8
Each position listed in the response corresponds to an output: left = output 1, right= output 8. The number shown in each position is the number of the input that is tied to the output represented by that position. Preset 1— Input 4 is tied to outputs 1 and 3, input 8 is tied to output 2, input 6 is tied to outputs 4 and 5, and input 2 is tied to output 6. No input is tied to outputs 7 and 8.			
List individual sync	<code>[X1]LS</code>	<code>[X7]←</code>	1 = sync detected, 0 = no sync.
NOTE <i>Input sync information is available by request only. No unsolicited responses are made.</i>			
NOTE <i>The switcher always detects if an SDI signal is present. However, due to the switcher's input circuit sensitivity, the switcher may report that a signal is detected when no signal is present at the input.</i>			
Information requests			
Information request <i>Example:</i>	I i	<code>V[X9]X[X10]←</code> <code>V8X8←</code>	8 inputs and 8 outputs.
Request part number <i>Example:</i>	N n	<code>68-xxx-xx←</code> <code>60-401-01←</code>	See appendix A for part #s. DXP 88 SDI part # is 60-401-01.
Query software version <i>Example:</i>	Q q	<code>[X8]←</code> <code>2.00←</code>	The version number shown is for example only.

Programmer's Guide, cont'd



Digital XPoint Matrix Switchers

5

Chapter Five

Matrix Software

Matrix Switchers Control Program

Button Label Generator

Matrix Software

Matrix Switchers Control Program

The Windows-based Extron Matrix Switchers Control Program, which communicates with the switcher via the rear panel Remote RS-232/RS-422 port provides an easy way to set up ties and sets of ties. The program is compatible with Windows 2000 and Windows XP.

Installing the software

The program is contained on the Extron Software Products CD-ROM, disk B. Install the software as follows:

1. Insert the CD-ROM into the drive. The installation program should start automatically. If it does not self-start, run Launch.exe from the CD.

The Extron software CD window appears (figure 5-1).



Figure 5-1 — Software CD window

2. Click the Software tab (figure 5-1).
3. Scroll to the desired program (Matrix Switchers Control Program) and click Install (figure 5-2).



Figure 5-2 — Software installation

4. Follow the on-screen instructions. By default, the Windows installation of the Matrix Switchers Control Program creates a C:\Program Files\Extron\Matrix_Switcher directory, and it places three icons into a group folder named "Extron Electronics\Matrix Switchers." The three installed icons are:
 - MATRIX Switcher+ Control Program
 - MATRIX Switcher+ Help
 - Uninstall MATRIX Switcher

Using the software

Many items found in the Matrix Switchers Control Program are also accessible via front panel controls and the LCD display (see chapter 3, “Operation”) and under SIS control (see chapter 4, “Programmer’s Guide”). The Matrix Switcher+ Help Program provides information on settings and on how to use the control program itself.

1. To run the Matrix Switchers Control Program, double-click on the Matrix Switchers Control Program icon (shown at right) in the Extron Electronics group or folder. The comm port selection window (figure 5-3) appears.



MATRIX Switcher+
Control Pgm

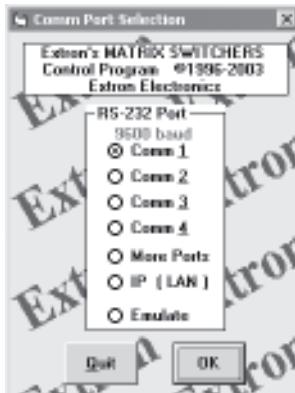


Figure 5-3 — Comm port selection window

2. Select either the comm port that is connected to the DXP’s RS-232/RS-422 port or *Emulate* and click *OK*.

NOTE *Although IP [LAN] is available for selection, the switcher does not have an Ethernet port. Do not select IP [LAN].*

If you selected a comm port, proceed to step 3.

If you selected Emulate, see “Using emulation mode” in this chapter.

Matrix Software, cont'd

3. The Matrix Switchers Control Program window appears (figure 5-4 and figure 5-5) displaying the current configuration of the connected switcher.

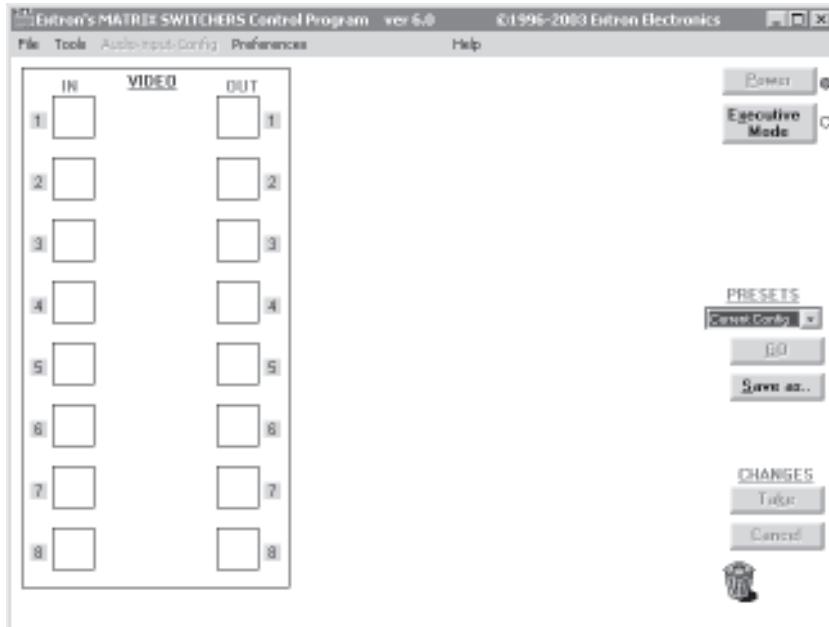


Figure 5-4 — Extron Matrix Switchers Control Program window (blank)

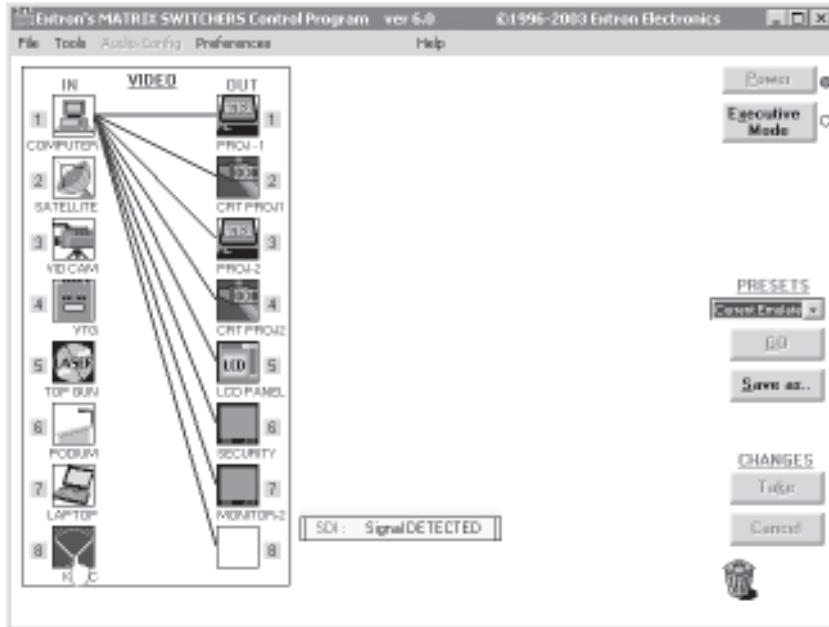


Figure 5-5 — Sample program window showing ties and icons

- To make the control program easier to use, assign a device icon to each input and output. Click on a box that represents an input or output, and drag the desired icon onto the box from the icon palette that appears.
- To create a tie, click on and drag an input box to one or more output boxes. To remove a tie, drag the output box to its tied input box.

- For quick display of information on a specific input or output, position the cursor over that device in the control program window. The program opens a window that details the connections to that device. See the inset box in figure 5-5.

Windows buttons, drop boxes, and trash

The buttons on the right side of the control program's window perform the following functions:

Power — Unavailable for Digital XPoint Series switchers, because the switcher power cannot be controlled via software.



Executive mode — Allows you to lock out front panel operations, except for the view-only mode functions.

Presets drop box — Displays a list of up to 16 presets. You can select a preset from the list to display it in the window and either activate it (**Go**) or delete it (**Delete**).

Go — Activates the preset displayed in the Preset drop box as the current configuration.

Save as — Allows the current set of ties to be saved as a preset. Enter the preset number when prompted to do so.

Delete — Deletes the preset displayed in the Presets drop box.

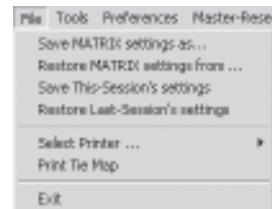
Changes - Take — Allows you to save to file any changes made to the displayed configuration.

Changes - Cancel — Returns to the previous screen, undoing any changes you have made.

Trash can — Drag and drop from an input or output button to the trash to unmake all ties associated with that input or output.

Windows menus

File menu



Save matrix settings as — Saves a complete set of up to 16 presets, plus the last active setting (preset #0), to a file. Saved settings include assigned icons and icon captions.

Restore matrix settings from — Loads and activates a previously saved setting file.

Save this-session's settings — Saves the current assigned icons and icon captions.

Restore last-session's settings — Loads the icons and icon captions that were saved during the last session. If you saved the previous session's changes to disk the last time you exited the program, the ties from the that session are also loaded.

Select printer — Selects the target printer.

Print tie map — Prints the tie set that is displayed on the screen.

Exit — Closes the Extron Matrix Switchers Control Program.

Matrix Software, cont'd

Tools menu

Assign device icons — Displays the complete set of input and output device icons. You can drag any of these icons to the input and output boxes.

Edit device palette — Allows you to add your own device icon graphics.

Name presets — Allows you to assign a name to each of the 16 memory presets.

Show RS-232 strings — Displays the ASCII commands that are used by the current configuration. You can refer to these for RS-232 programming.

Initialize — Initializes and clears any or all of the following: ties, presets, preset titles, icon names, and icons.



Preferences menu

Immediate changes — Causes changes to take effect immediately.

Hold/verify changes — Delays implementation of changes until the Changes – Take button is pressed.

Ties as lines — Displays ties as lines (figure 5-6).

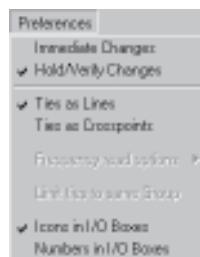


Figure 5-6 — Ties shown as lines

Ties as crosspoints — Displays ties as a grid of inputs and outputs (figure 5-7). Made ties are indicated as amber boxes. Ties that will effect when you click the *Take* button are indicated by +. Ties that will be broken when you click the *Take* button are indicated by -.

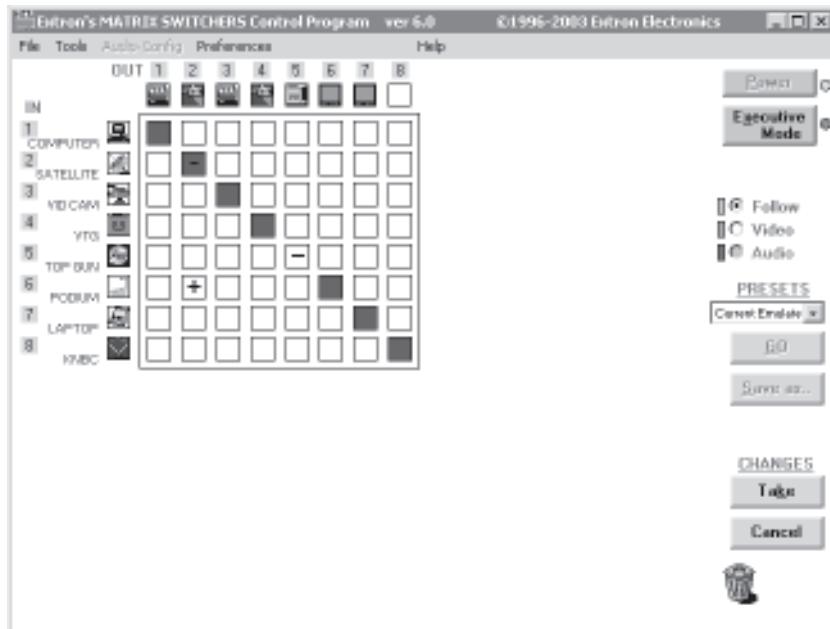


Figure 5-7 — Ties shown as crosspoints

Frequency read options — Allows you to set the input signal detection feature as follows (see the inset box in figure 5-5):

- To never sample and display the sync or no sync status (set this option to **None**)
- To automatically refresh the display (set this option to **Automatically every 10 seconds**)
- To sample the sync and update the display whenever you make a configuration change (set this option to **On demand or by refresh**).

NOTE

*The switcher **always** detects if an SDI signal is present. However, due to the switcher's input circuit sensitivity, the switcher **may** report that a signal is detected when no signal is present at the input.*

Icons in I/O boxes — Erases any numbers in the I/O boxes in the control program window (figure 5-4). You can place icons in the boxes.



Numbers in I/O boxes — Erases any icons in the I/O boxes in the control program window and fills each box with the associated input or output number.



Matrix Software, cont'd

Using emulation mode

Emulation mode allows you to set up the software without attaching the switcher to the computer. To use emulation mode, do the following:

1. Double-click the Matrix Switchers Control Program icon in the Extron Electronics group or folder.
2. Choose *Emulate*, and click *OK*.
3. Choose an emulation file to open, and click *OK*. The file DEMO.MTX provides a sample of a completed matrix setup. The file NEW.INI provides a blank setup to get you started.
4. Enter the file name under which you want to save any changes to the file, and click *OK*.
5. Select the *Matrix Model DXP Series*.
6. Select the correct Video Boards configuration for your model (4x4 or 8x8) and click *OK*.
7. Continue using the program as described in *Using the software*, steps 3 through 5, beginning on page 5-3.

Using the help system

For information about program features, you can access the help program in any of the following ways:

- From the Extron Electronics program folder or group, double-click on the Matrix Switcher+ Help icon (shown at right). 
- From within the Matrix Switchers Control Program, click on the *Help* menu on the main screen.
- From within the Matrix Switchers Control Program, press the F1 key.

Button Label Generator

The Button Label Generator software creates labels that you can place in the translucent covers of the input select buttons. You can create labels with names, alphanumeric characters, or even color bitmaps for easy and intuitive input and output selection. See chapter 6, "Maintenance and Modifications", for the procedure for removing and replacing the translucent covers.

The Extron Button Label Generator is available on the Extron Web site, www.extron.com, under the Download Center tab. Click the Software link (figure 5-8), and download and install the program.



Figure 5-8 — Location of Software on the web site.

NOTE The Button Label Generator software is also included on the Extron Software Products CD-ROM that accompanied the switcher.

By default, the Windows installation creates a C:\Program Files\Extron\ButtonLabelGenerator directory and places the Button Label Generator icon into a group or folder named “Extron Electronics”.

Using the software

1. To run the Button-Label Generator program, double-click on the Button-Label Generator icon (shown at right) in the Extron Electronics group or folder, and click OK when prompted. The Button-Label Generator window appears (figure 5-9).

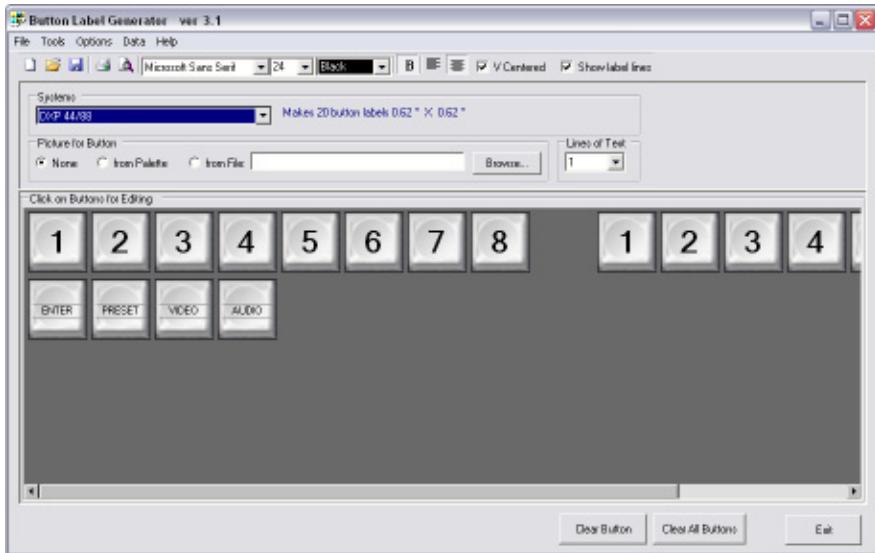


Figure 5-9 — Extron's Button-Label Generator window

2. In the Systems selection, choose “DXP 44/88”.
3. Using normal Windows controls, you can create and print labels that can be placed in the label windows on the front panel of the switcher.
4. Press the *Clear All Buttons* button to create new labels as many times as necessary to make all of the button labels that you need.

Access the Help program by clicking on the Help menu. Click on the Help menu on the main screen, choose Show Help, and click on the Load Demo button to see an example of a completed Extron's Button-Label Generator window.

Matrix Software, cont'd



Digital XPoint Matrix Switchers

6

Chapter Six

Maintenance and Modifications

Hardware Upgrades and Maintenance

Creating and Installing Button Labels

Maintenance and Modifications

Hardware Upgrades and Maintenance

This chapter contains procedures for performing hardware maintenance procedures such as swapping the RS-232 and RS-422 ports, installing a new firmware update, and replacing the fuse.

Opening the switcher

Before you can perform any of the hardware upgrade procedures, you must open the switcher. The interior of the Digital XPoint 44 and 88 Matrix Switchers is accessed by removing the top cover.

Open the Digital XPoint switcher as follows:

1. Disconnect the power cord from the switcher.
2. If the switcher is rack mounted, remove the switcher from the rack and place it on a clean workspace.
3. Remove the fourteen screws (8 top screws and 6 side screws) that secure the top cover of the DXP (figure 6-1).

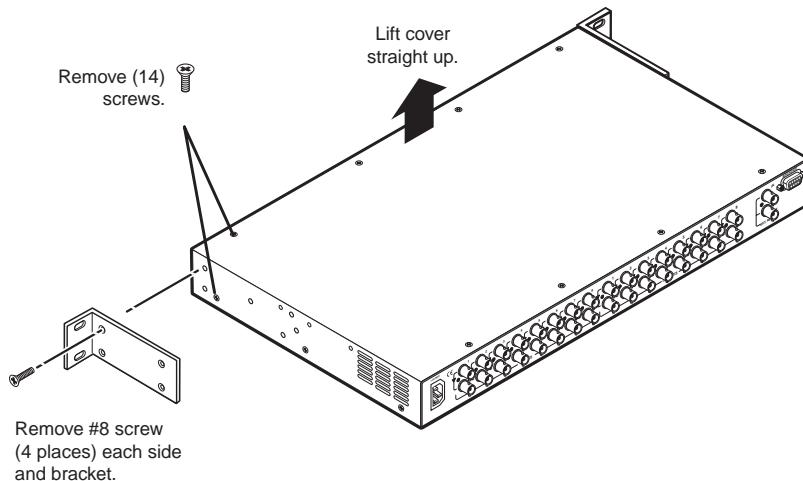


Figure 6-1 — Removing the top cover

4. Lift the top cover straight up and set it aside.

Closing the switcher

Place the top cover in place and replace all the screws that you removed in "Opening the switcher".

Swapping the serial ports

The Digital XPoint Matrix Switchers are factory configured for RS-232 use. If you want to use RS-422 and the switcher is configured for RS-232, or if you want to use RS-232 and the switcher is configured for RS-422, do the following:

1. Follow the instructions in “Opening the switcher” to gain access to the interior of your switcher.
2. On the switcher’s main circuit board (figure 6-2), locate the RS-232 and RS-422 ribbon cable. Shift the cable to the desired receptacle.
3. On the switcher’s main board, locate jumper J19. Shift the jumper to the desired configuration.
4. Reinstall the switcher’s cover. See “Closing the switcher” on page 6-2.

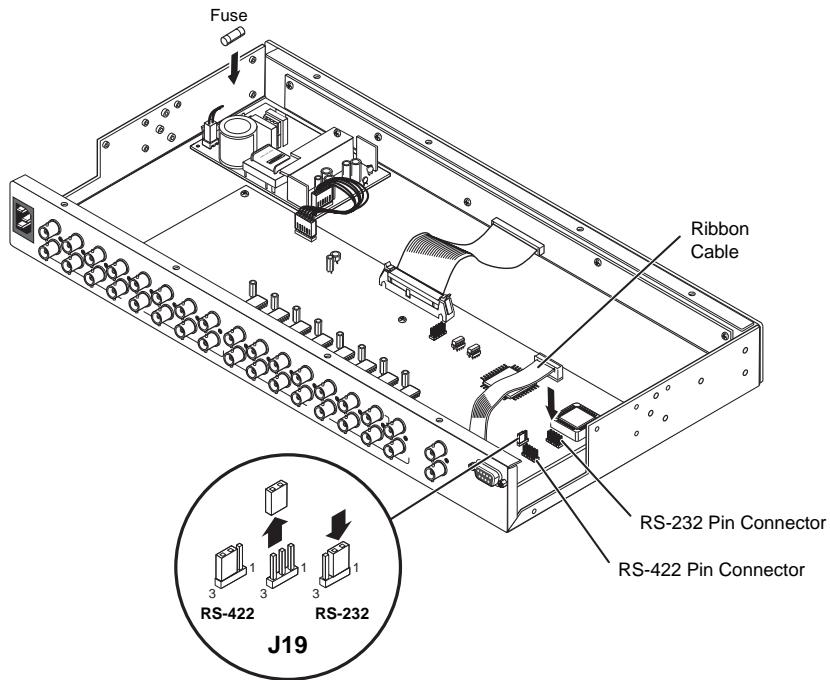


Figure 6-2 — Digital XPoint switcher main board

5. Attach the power cord to the switcher and to the AC power source. Ensure that the switcher is working properly.
6. If the switcher was removed from a rack, remove its power cord, reattach the switcher to the rack, and reconnect the power cord.
7. Reconnect the input and output cables.

Maintenance and Modifications, cont'd

Installing a firmware update

NOTE The integrated circuit device that contains the firmware for the switcher also contains the memory in which presets are saved. When you replace the IC, these settings are lost. You may want to record the presets before you replace the IC.

To replace the firmware, do the following:

1. Follow the instructions in "Opening the switcher" on page 6-2 to gain access to the interior of your switcher.
2. Locate IC U42 (figure 6-3).

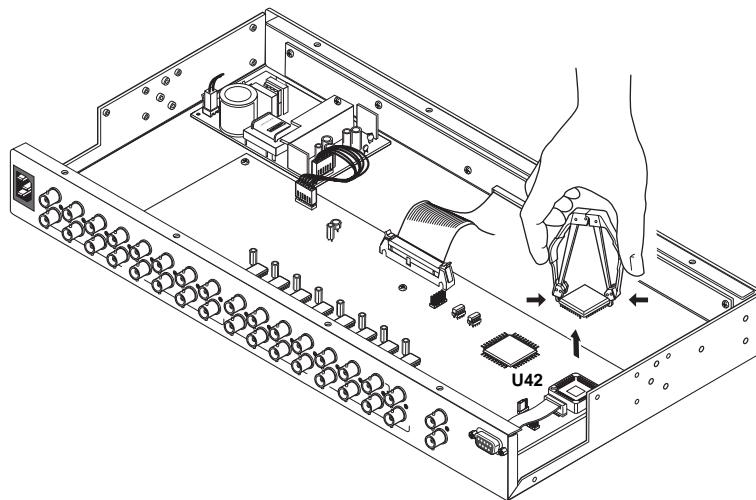


Figure 6-3 — Replacing U42

3. Use a PLCC IC puller to remove the existing firmware IC. Squeeze the tool to align its hooks with the slots in opposite corners of socket U42. Insert the hooks, squeeze gently, and pull the IC straight out of the socket. Set the IC aside.
4. Note the key (angled corner) of the new firmware IC and the dot on the underside that indicates pin 1 (figure 6-4). Orient the IC to match the key and pin 1 (indicated by arrow) on the socket, and carefully press the IC into place.

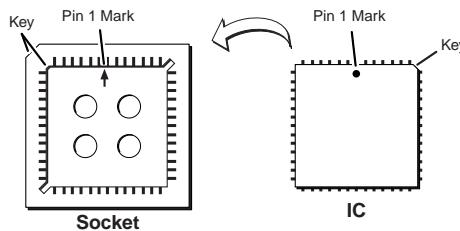


Figure 6-4 — Pin 1 mark

5. Reinstall the switcher's cover. See "Closing the switcher" on page 6-2.

WARNING If you choose to check for proper operation before putting the cover back on, ensure that tools and hands are outside the switcher and then perform step 6. After recognizing the new IC, the switcher should power up normally. Unplug the AC power cord, and reinstall the cover.

6. Reinitialize the switcher to recognize the new IC as follows:
 - a. Connect the power cord to the AC power source.
 - b. Press and **hold** the Enter button while you connect the power cord to the switcher.
 - c. Continue to hold the Enter button until the power up sequence is completed (all front panel buttons cycle on and off from left to right lit green, right to left lit red, and left to right lit amber).
 - d. Release the Enter button.
7. Ensure that the switcher is working properly.
8. If the switcher was removed from a rack, remove its power cord, reattach the switcher to the rack, and reconnect the power cord.
9. Reconnect the input and output cables.

Replacing the AC fuse

The AC fuse on the power supply board is a user-replaceable component. Replace the AC fuse as follows:

1. Follow the instructions in “Opening the switcher” on page 6-2 to gain access to the interior of the switcher.
2. Locate the fuse on the power supply board (figure 6-2), and remove it from its retaining clips.
3. If test equipment is available, you can check the fuse.
4. Place a new 2.5 A/250V fast-blow fuse in the retaining clips.
5. Reinstall the switcher’s front panel and cover. See “Closing the switcher” on page 6-2.

WARNING *If you choose to check the switcher for proper operation before putting the cover back on, ensure that tools and hands are outside the switcher, and then connect the power cord to the unit and to an AC source. The switcher should power up normally. Unplug the AC power cord, and reinstall the cover.*

6. Attach the power cord to the switcher and to the AC power source. Make sure the switcher is working properly.
7. If the switcher was removed from a rack, remove its power cord, reattach the switcher to the rack, and reconnect the power cord.
8. Reconnect the input and output cables.

Maintenance and Modifications, cont'd

Creating and Installing Button Labels

Figure 6-6 provides blank button labels. If desired, photocopy them or cut them out of the manual, write button information in each button area as desired, and put them in the switcher's input or output button windows.

Use the following procedure to install new labels in the DXP's front panel buttons.

1. Make new labels using either the blanks on page 6-7 or the Button-Label Generator software (see chapter 5, "Matrix Software"). Cut them out.
2. Remove the button from the DXP by grasping the button firmly and pulling it away from the front panel (figure 6-5).

NOTE *There are different button models available. Your buttons may appear different.*

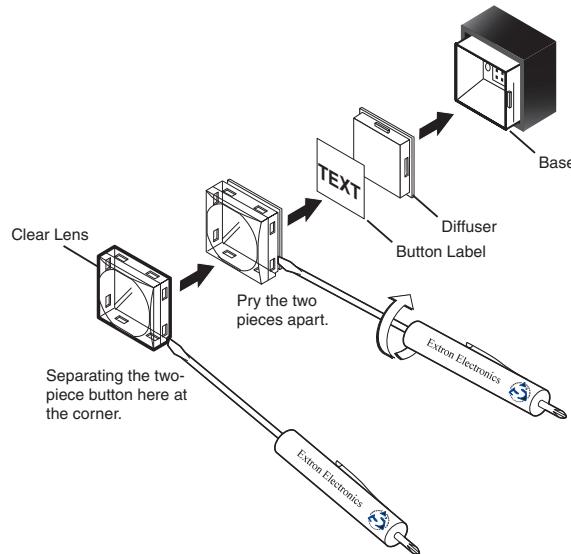


Figure 6-5 — Illuminated button label replacement

3. Use a small screwdriver or Extron Tweeker to gently lever the button cap off of the white backing plate.
4. Insert a button label into the cap and gently but firmly press the cap onto the white backing plate.
5. Press the button into place in the matrix switcher.

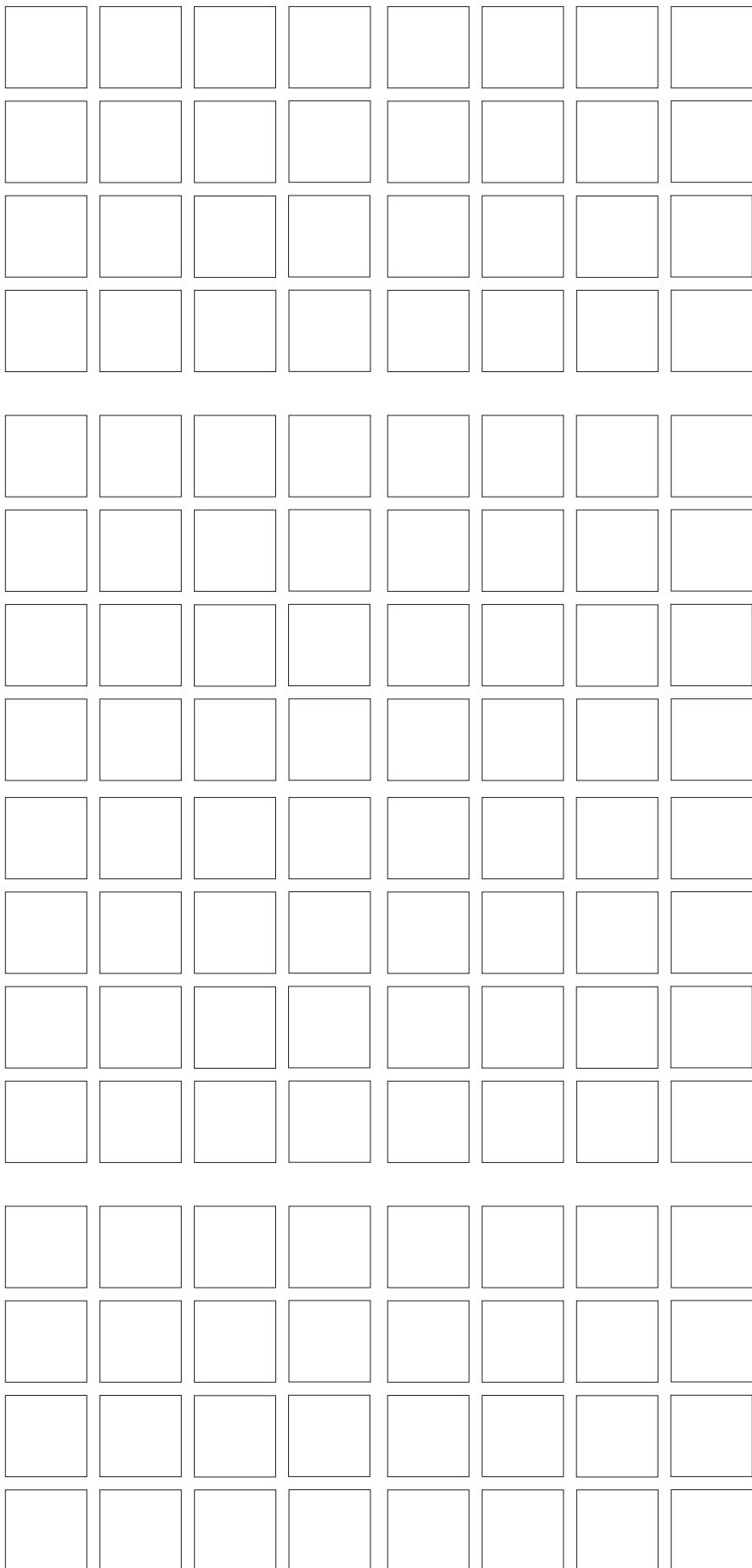


Figure 6-6 — Button label blanks

Maintenance and Modifications, cont'd



Digital XPoint Matrix Switchers

A

Appendix A

Reference Information

Specifications

Part Numbers

Reference Information

Specifications

Video

Routing

DXP 44 SDI.....	4 x 4 matrix
DXP 88 SDI.....	8 x 8 matrix
Data rates	143 Mbps, 177 Mbps, 270 Mbps, 360 Mbps
Auto data rate lock	Yes
Standard	SMPTE 259M
Data types	8 bit or 10 bit

Video input

Number/signal type

DXP 44 SDI.....	4 SDI serial digital video (8 or 10 bit SMPTE 259 M widescreen 16:9, component 4:2:2, and composite video) inputs, and 4 buffered loop-throughs
DXP 88 SDI.....	8 SDI serial digital video (8 or 10 bit SMPTE 259 M widescreen 16:9, component 4:2:2, and composite video), and 8 buffered loop-throughs

Connectors

DXP 44 SDI.....	4 female BNC for input, 4 female BNC for loop-through
DXP 88 SDI.....	8 female BNC for input, 8 female BNC for loop-through
Input cable equalization	1 to 300 m for data rates up to 270 Mbps
	1 to 200 m for data rates up to 360 Mbps
Auto equalization	Yes
Input return loss	>15 dB, 5 MHz to 270 MHz
Recommended cable type	Extron SHR or equivalent
Impedance	75 ohm
External sync (genlock)	0.3 V to 0.4 Vp-p

Video output

Number/signal type

DXP 44 SDI.....	4 dual SDI serial digital video (SMPTE 259 M widescreen 16:9, component 4:2:2, and composite video)
DXP 88 SDI.....	8 dual SDI serial digital video (SMPTE 259 M widescreen 16:9, component 4:2:2, and composite video)

Connectors

DXP 44 SDI.....	4 x 2 BNC female
DXP 88 SDI.....	8 x 2 BNC female
Number of outputs per channel ..	2 outputs per channel
Nominal level	0.8 V \pm 10%
Impedance	75 ohms
Return loss	>40 dB @ 5 MHz
DC offset	\pm 500 mV maximum with input at 0 offset
Jitter	<0.2 μ s p-p
DC offset (termin. @ 75 ohms) ...	0.5 V (\pm)
Rise and fall time (20-80%)	0.6 ns = 100 ps

Control/remote — switcher

Serial control port	RS-232 or RS-422, 9-pin female D connector
Baud rate and protocol	9600 baud, 8 data bits, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND
Program control	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™)

General

Power	100 VAC to 240 VAC, 50/60 Hz, 40 watts, internal
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling	Convection, vented, vents on top and side panels
Rack mount	Yes, with included mounting brackets, 1U high. These can also be mounted under or through furniture with the provided brackets.
Enclosure type	Metal
Enclosure dimensions	1.75" H x 17.5" W x 9.5" D (1U high, full rack wide) 4.4 cm H x 44.4 cm W x 24.1 cm D (Depth excludes connectors. Width excludes rack ears.)
Product weight	4.9 lbs (2.2 kg)
Shipping weight	8 lbs (4 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE, FCC Class A, AS/NZS, ICES
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE All nominal levels are at ±10%.

NOTE Specifications are subject to change without notice.

Reference Information, cont'd

Part Numbers

Digital XPoint part numbers

Extron Part	Part #
Digital XPoint 44 SDI	60-402-01
-or-	
Digital XPoint 88 SDI	60-401-01
Extron Software Products CD	
Digital XPoint Matrix Switchers User's Manual	

Replacement parts

Replacement parts	Part #
Button and cap diffuser kit	70-352-01
Button overlays	100-196-01

Optional accessories

Extron Part	Part #
MKP 1000	
Gray	60-239-01
Black	60-239-02
White	60-239-03
MCP 1000M (master)	60-298-01
MCP 1000S (slave)	60-298-02
RCA-to-BNC adapter	10-264-01

Cables

Use high resolution coaxial cables to achieve maximum performance.

Bulk cable and connectors

Part	Part #
RG6 BNC/1 bulk , 500' (152 meters)	22-098-02
RG6 BNC/1 bulk , 1000' (305 meters)	22-098-03
BNC male RG6 crimp connectors, qty. 50	100-260-01

Pre-cut cables

Part	Part #
RG6 BNC/3 (3' /90 centimeters)	26-383-01
RG6 BNC/6 (6' /1.8 meters)	26-383-12
RG6 BNC/12 (12' /3.6 meters)	26-383-07
RG6 BNC/25 (25' /7.6 meters)	26-383-04
RG6 BNC/35 (35' /10.6 meters)	26-383-13
RG6 BNC/50 (50' /15.2 meters)	26-383-05
RG6 BNC/75 (75' /22.8 meters)	26-383-06
RG6 BNC/100 (100' /30.4 meters)	26-383-03
RG6 BNC/150 (150' /45.7 meters)	26-383-08
RG6 BNC/200 (200' /61.0 meters)	26-383-09
RG6 BNC/250 (250' /76.2 meters)	26-383-10
RG6 BNC/300 (300' /91.4 meters)	26-383-11

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

**USA, Canada, South America,
and Central America:**

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805, USA

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

Japan:

Extron Electronics, Japan
Kyodo Building
16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.



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